

## MIND

## A QUARTERLY REVIEW

OF

## PSYCHOLOGY AND PHILOSOPHY.

## I.—GREEN'S ETHICS.

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GREEN'S *Prolegomena to Ethics* is a highly interesting and impressive book; and no one who makes the study of morality a matter of serious concern—to whatever school he may belong—can read it without instruction and edification. At the same time I do not find myself able to obtain from it a clear and consistent conception of the author's ethical system, even in outline. It may be said that the book does not profess to give such a system; its title indicates that it consists merely of "Prolegomena" to a future or possible systematic exposition of ethics; and the calamity which prevented its completion has left it imperfect in the very part in which the plan of such a systematic treatise might have been expected to be at least foreshadowed. I admit the force of these considerations; and therefore I do not put forward the following arguments as a formal criticism of what has perhaps not been formally attempted: I merely think it worth while to state the reasons why—though fully appreciating both the philosophical importance of this work and its remarkable literary qualities—I am unable to put together into a coherent whole the different expressions of Green's ethical view which I find in it.

Green's doctrine as to the basis of morality, in the most

comprehensive account which he gives of it, is stated to be a "Theory of the Good as Human Perfection". The Perfection which is thus taken to be the ultimate end of rational conduct is otherwise described as the "realisation," "development" or "completion" of human "faculties" or "capabilities". If we ask further to what part of man's apparently composite nature these "faculties" or "capabilities" belong, we are told that they are "capabilities of the spirit which is in man" to which, again, a "divine" or "heaven-born" nature is attributed. The realisation of these capabilities is, in fact, a "self-realisation of the divine principle in man"; that is, of the "one divine mind" which "gradually reproduces itself in the human soul". "God," we are elsewhere told, "is a being with whom the human spirit is identical, in the sense that He is all which the human spirit is capable of becoming" (p. 198). Hence the conception of the Divine Spirit presents to the man who is morally aspiring an "ideal of personal holiness" with which he contrasts his own personal unworthiness.

If, however, we are to obtain from these notions anything more than a vague emotional thrill, which, however salutary it may be, cannot carry with it any ethical instruction, we must go on to ask how this relation of man to God is philosophically known, and what definite and reasoned content can be given to this notion of a Divine Spirit. It would appear from the order of Green's treatise, and the proportions of its parts, that an answer to these questions was intended to be given in Book i., on the "Metaphysics of Knowledge". Here we are certainly introduced to a "spiritual principle in nature" corresponding to the spiritual principle implied in all human knowledge or experience. It is argued (pp. 30, 32) that to constitute the "single, all-inclusive, unalterable system of relations," which we find in nature, properly understood, something beyond nature is needed: "something which renders all relations possible," and supplies the "unity of the manifold" which is involved in the existence of these relations. "A plurality of things cannot of themselves unite in one relation, nor can a single thing of itself bring itself into a multitude of relations . . . there must therefore be something other than the manifold things themselves which combines them." Such a "combining agency" in each one's experience is his own intelligence, his intelligent self which unites the objects of his experience while distinguishing itself from them. Hence if we suppose nature to be real "otherwise than merely as for us," we must "recognise as the condition of this reality



the action of some unifying principle analogous to that of our understanding". Indeed, Green passes—I do not precisely understand how—from the affirmation of *analogous action* to the affirmation of *identical quality*, and says that nature in its reality implies not only an all-uniting agency which is not natural, but a thinking self-distinguishing consciousness like our own. We further find that this principle of synthesis or unity is "eternal," in the sense that it is not in time, and "complete," in the sense that its combining agency extends to all conceivable objects; and that our own empirical knowledge can only be explained as an imperfect reproduction in us of this eternally complete consciousness.

I am obliged to summarise very briefly the results of an elaborate and complicated argument; but I am not now concerned with the argument itself, merely with the ethical bearing and value of its results; and I venture to think that the above meagre statement gives substantially all the characteristics which Green explicitly attributes to the "spiritual principle" disclosed to us in Book i.—and all, I submit, that can possibly be known about it by the lines of reasoning there developed. And I am confirmed in this view by the passage in Book iii., ch. 2 (p. 189), in which the "conclusions so far arrived at are summarised"; since there also the "one divine mind" which "gradually reproduces itself in the human soul" is not represented with any other "constant characteristics" beyond those of being a unifying, self-distinguishing, self-objectifying consciousness. "If," says the author expressly, "we mean by personality anything else than the quality in a subject of being consciously an object to itself, we are not justified in saying that it necessarily belongs to God." But how, I would ask—with all reverence for the deep religious emotion of our author,—can we possibly get an "ideal of holiness," of an "infinitely and perfectly good will," out of this conception of a combining, self-distinguishing and self-objectifying agency? What perfection can the human spirit aim at, so far as it is merely conceived as the reproduction of such an agency, except the increase of knowledge, extensively or intensively? the presence to the combining intelligence of a more extensive manifold of combined objects, or the presence of them as more effectively combined? I need not say that nothing can be more unlike this conception than Green's moral ideal; in which, indeed, as I shall presently argue, knowledge rather occupies a too subordinate place.

It may be said perhaps that though the Divine Mind cannot

be *known* to us as more than a combining intelligence, the source of the systematic unity of nature, we may and ought to *believe* it to be more; and that Green must be supposed to mean this when he describes the "attitude of man towards an infinite spirit" as "not the attitude of knowledge" but only of "awe and aspiration" (p. 329). But the reason he gives for excluding the attitude of knowledge is a reason which, so far as it is valid at all, applies precisely to that conception of the spiritual principle which is given in Book i.: "knowledge," he says, "is of matters of fact or relations, and the infinite spirit is neither fact nor relation"; and since the net result of the "Metaphysics of Knowledge" is at any rate to establish the necessary existence of an eternally complete thinking consciousness which is "neither fact nor relation," but yet "needed to constitute" facts and relations, it seems to me merely an eccentric subtlety of metaphysical terminology to say that we have no "knowledge" of such an eternal mind. We have at any rate, if we have followed assentingly a hundred pages of close argument, a reasoned conviction with regard to it; and my point is that Green seems unaware of the barrenness of this conviction for his ethical purposes, and nowhere offers us a suggestion of any other reasoning by which his philosophical conception of the Divine Mind might be turned into one capable of furnishing us with an adequate ethical ideal. I, at least, can find no grounds in the argument of Book i. for attributing to the spiritual principle any such characteristic as the term "holiness" expresses: I cannot even find adequate reasons for attributing to it anything analogous to Will. It is merely, so far as I understand, an eternal intellect out of time, to which all time and its contents are eternally and (we may say) indifferently present: being equally implied in the conception of *any* succession, it is not shown to carry with it the conception of progress towards an end in the series of motions or changes of which the process of the world in time consists. And even if we grant that such a progress is implied in the development of the eternal consciousness in *us*, it is, as I have already said, still a purely intellectual progress, a growth of that which knows in knowledge alone.

I have so far proceeded on the assumption that the "human perfection" which we are trying to define is the perfection of that spiritual principle which is said to be in a manner identical with God, being an imperfect reproduction of the eternal divine consciousness. But, the classically instructed reader of the *Prolegomena*, remembering the ethical psychology of Aristotle, and noting the large share of

influence which the study of Aristotle has obviously had on Green's speculation, may perhaps surmise that our ideal of human perfection—so far as it is practical and (in a narrow sense) ethical, and not scientific or merely intellectual—belongs rather to the human soul as a function of an animal organism, modified by being made a vehicle of the eternal consciousness, and not to that eternal consciousness itself, as making the animal organism the vehicle. And this surmise would certainly find considerable support in the analysis and exposition of the psychological elements of moral action—desire, intellect, volition—which Green has given in Book ii. The author, indeed, is specially concerned to maintain the real unity between the effort of the self-conscious soul in learning to know, and its effort “in the way of giving to or obtaining for objects, which various susceptibilities of the self-conscious soul suggest to it, a reality among matters of fact” (p. 138). But he recognises that its efforts of this latter kind, to a large extent, “originate in animal wants or the susceptibility to animal pleasure, in the sense that without such want or susceptibility they could not be” (p. 129); and though he denies that the desires most important in the moral life of civilised man—such as love, envy, ambition—are directly dependent on animal susceptibilities, I do not understand him to deny that they may be traced ultimately to animal feelings, as modified by the supervision of self-consciousness carrying with it a consciousness of the individuality of other persons. Certainly animals feel love, envy, jealousy; and no reason is suggested why a reproduction of the eternal consciousness should have these emotions, independently of the conditions of the animal organism to which it is subject. Admitting Green's account of the manner in which the self-conscious self reacts upon the desires thus organised, so that they become something different from what they would be in a merely animal soul: admitting that it presents to itself objects of desire, distinct from itself and from each other, and that in seeking the realisation of any particular object it is always seeking its own satisfaction; I should still have inferred that it is only because it has “supervened upon the appetitive life” of an animal organism that the self-conscious self has such desires for the realisation of objects at all. And since the essential characteristic of moral action, as explained in Book ii., consists in the presence of this self-distinguishing and self-seeking consciousness, identifying itself with different particular desires—or rather usually with a complex resultant of several distinguishable desires;

I should have expected that man's pursuit of perfection would be traced to some combination of natural desires modified by self-consciousness.

But the account of the moral ideal, which the author proceeds to give in Book iii., does not correspond to this expectation: the impulse of the spirit to seek "moral good" is rather represented as being in profound contrast and antagonism to the impulses of the animal soul. We are told that though self-satisfaction is continually *sought* by moral agents in the realisation of the objects of particular desires—due to the conditions under which the self-conscious subject exists in the human organism—it cannot be really found there. "The conditions of the animal soul, 'servile to every skiey influence,' no sooner sated than wanting, are such that the self-determining subject cannot be conscious of them as conditions to which it is subject . . . without seeking some satisfaction of itself that shall be independent of these conditions." Accordingly though "good" is defined as "that which satisfies some desire," "moral good" or the "true good" is defined as "an end in which the effort of a moral agent may really find *rest*" (p. 179)—or, as Green elsewhere expresses it, "an abiding satisfaction of an abiding self" (p. 250).

That is, this appears to be Green's view on the whole, though there is a certain ambiguity or hesitation in his language. In some passages he rather confuses the reader by apparently using "good" to denote the object in which self-satisfaction is sought, whether or not it is really found in it. Thus he speaks (p. 99) of a moral agent presenting to himself a certain idea of himself as an "idea of which the realisation *forms*"—not *seems*—"for the time his good". So again, p. 166—"The man who calmly faces a life of suffering in the fulfilment of what he conceives to be his mission could not bear to do otherwise. So to live is his good"; where the context shows that such a man is not therefore conceived to find satisfaction in so living. But supposing we understand "good" in such passages to mean 'apparent' or 'anticipated' good, another difficulty remains. Green holds, of course, that particular desires are continually being satisfied; and since he speaks of the moral agent as "identifying itself" with such desires (or their objects) and even speaks of a "particular *self*-satisfaction" to be gained in attaining one of these objects (p. 108), I do not see how he can consistently deny that the good even of a moral agent is *temporarily* gained in such "particular self-satisfactions". Still, the passages in which such denial is explicitly or im-

PLICITLY made are too numerous and unmistakeable to leave any doubt that they express a doctrine deliberately held. Such a doctrine indeed is indispensable as a basis to the intermittent controversy with Hedonism which Green carries on throughout the treatise; since, so far as I can see, his only substantial objection to the Hedonistic end relates to its transient quality: it is not a "permanent" or "abiding" good. He still indeed clings to the paradox maintained by him on previous occasions of controversy<sup>1</sup> that "a greatest sum of pleasures" is "intrinsically unmeaning"; but a Hedonist, I think, need not seriously concern himself with the refutation of this paradox, since in another passage Green explains that he does not intend to "deny that there may be in fact such a thing as desire for a sum or contemplated series of pleasures, or that a man may be so affected by it as to judge that some particular desire should not be gratified"; and I need hardly say that he does not intend to deny that certain courses of action "tend to make life more pleasant on the whole," or that "an overbalance of pain on the whole would result to those capable of being affected by it" from certain other courses of action—in fact he expressly affirms both these propositions in the very words that I have used. In these propositions it is implied that pleasure and pain, as distinguished from their conditions, can be subjected—in some degree at least—to quantitative measurement; and therefore, when in another passage Green lays down that "pleasure (in distinction from the facts conditioning it) is not an object of the understanding," the Hedonist need not be troubled at the strange statement; for he will perceive that it is to be understood in some subtle metaphysical sense with which he is not concerned.<sup>2</sup> In short, the one anti-hedonistic argument on which our author now appears seriously to rely is that pleasures are of "perishing nature" and "do not admit of being accumulated in enjoyment":<sup>3</sup> that, there-

<sup>1</sup> Cf. MIND, VI., 267-9; and the Introduction to Hume's *Treatise on Human Nature*, § 7.

<sup>2</sup> I must confess that I cannot even conjecture in what sense Green lays down this proposition; since it appears to me that in this very discussion he conducts long arguments which are only intelligible if the distinction between pleasure and the facts conditioning it is thoroughly grasped and steadily contemplated by the understanding. And I may add that this distinction is carried to a degree of subtlety far beyond that which the Hedonist requires, or would be disposed to adopt; for Green insists on his distinguishing "pleasure" from the "satisfaction" involved in the conscious realisation of a desired object.

<sup>3</sup> In some passages I incline to think that Green's argument proceeds on the tacit—and surely quite unwarrantable—assumption that an "end," in

fore they are not in any sense permanent or "abiding," so that no amount of them can give real satisfaction to a moral agent, and constitute his true good. The pleasure-seeker, like the "animal soul," is "no sooner sated than wanting," the satisfaction of any particular desire is no sooner attained than a desire, similar or different, emerges again; and therefore true self-satisfaction is not attained; the effort of the moral agent does not "find rest".

Now, I have given this argument—which Green urges with a very impressive earnestness of conviction—my best consideration; and I am obliged to conclude that there must be very fundamental differences in the constitution of moral agents, if I may be allowed to count myself one. For if I understand what Green means by "rest," I can only say that I desire it as little as I expect it, in this life or in any other. The happiness that I have enjoyed has been conditioned by the perpetual presence—or rather the continually fresh emergence—of desire; and whether this condition is to be referred to the "animal soul" or not, I have no aversion to it and do not aspire to be independent of it. I recognise this dislike of desire and this contempt for transient satisfactions which Green expresses as characteristic of the conscious experience of certain meditative minds; but I can confidently deny that these feelings are necessary or universal, and I have no adequate ground for regarding them as even common among human beings generally. I admit that men frequently, under the influence of strong desire, are liable to the illusion that the agreeable "repose of a mind satisfied" will be at least a comparatively permanent consequence of attaining the desired object, and are temporarily disappointed when they find that this is not the case; but neither the expectation nor the disappointment is inevitable or universal: indeed, they seem to me rather experiences of the immature mind, which riper reflection on the relation of desire to life tends to suppress. The man who has philosophised himself into so serious a quarrel with the conditions of human existence that he cannot be satisfied with the prospect of never-ending bliss, because its parts have to be

the ethical use of the term, ought to mean something to which we gradually get nearer and nearer—some sort of goal or consummation. But all that I, and (I conceive) most ethical writers, mean by the term is an object of rational aim—whether attained in successive parts or not—which is not sought as a means to the attainment of any ulterior object, but for itself. And so long as any one's prospective balance of pleasure over pain admits of being made greater or less by immediate action in one way or another—which Green does not deny—there seems no reason why 'Maximum Happiness' should not provide a serviceable criterion of good.

enjoyed successively, and under the condition of being successively desired—such a man, I venture to think, is not a typical *φρόνιμος*.

I have digressed somewhat from the main line of my discussion, because I could hardly avoid noticing the anti-hedonistic controversy which occupies so large a space in the *Prolegomena*: but as my primary object is not to criticise Green's view from the outside, but rather to exhibit the difficulties of framing a clear and consistent notion of it, I will assume for the present that the true good of man must be a "permanent" or "abiding" good, and therefore cannot be pleasure. What then is it? and what ground have we for supposing it attainable by man? It does not appear that the path of moral progress, even as pursued with the most stoical contempt for attendant pleasures and pains, is one in which the effort of the moral agent finds "rest," at least in this earthly sphere. Green, at any rate, does not maintain this: he says of the "man who calmly faces a life of suffering in the fulfilment of what he conceives to be his mission," that "if he could attain the consciousness of having accomplished his work, . . . he would find satisfaction in the consciousness," but adds that "*probably just in proportion to the elevation of his character he is unable to do so*" (p. 166): it would seem therefore that he no less than the voluptuary is always pursuing and never attaining.

Perhaps it may be said that if the "abiding good" is not found by the man who is seeking perfection, it is at any rate approached by him; the moral aspirant who is daily growing less imperfect may not experience the satisfaction of attainment, but at any rate he is getting towards it.<sup>1</sup> But (1) what can this avail him if he never actually attains? and (2) even granting that the consciousness of approximation is the best substitute available to him for the consciousness of attainment in this earthly life, I cannot conceive in what sense this can be regarded as an "abiding satisfaction," unless there is a reasonable prospect of the continuance of his personal existence after death,—and I do not see that Green's reasonings give him any justification for such an expectation. We are told, indeed, that "a capacity consisting in a self-conscious personality cannot be supposed to pass away. It partakes of the nature of the eternal." But granting this, still everything depends on the extent and manner in which this participation is conceived: however

<sup>1</sup> P. 256. "But of particular forms of life we may say that they are better, because in them there is . . . a nearer approach to the end in which alone man can find satisfaction for himself."



true it may be that the human spirit is in a sense identical with the Divine Being, it is undeniably different from it as a self-conscious individual; and the question whether its participation in the nature of the eternal involves immortality of its distinct individual self is one which Green does not seem to me to have definitely faced. In the passage (pp. 193-5) in which he comes nearest to discussing it, the question that primarily seems to interest him is not whether the individual John or Thomas has reason to expect continued existence as an individual after death, but whether we have reason to expect that the life of the spirit will always be realised in *some* individual persons. What he is concerned to maintain is, that "the human spirit cannot develop itself according to its idea except in self-conscious subjects . . . the spiritual progress of mankind is an unmeaning phrase, unless it means a progress of which feeling, thinking, and willing subjects are the agents and sustainers". Considering the "promise which the spirit gives of itself, both in its actual occasional achievement and in the aspirations of which we are individually conscious"; we may, he thinks, "justify the suppositions that the personal life, which historically or on earth is held under conditions which thwart its development, is continued in a society, with which we have no means of communication through the senses, but which shares in and carries further every measure of perfection attained by men under the conditions of life that we know. Or we may content ourselves with saying that the personal self-conscious being, which comes from God, is for ever continued in God. Or we may pronounce the problem suggested by the constant spectacle of unfulfilled human promise to be simply insoluble."

Now doubtless the consideration of these alternatives, the weighing of the *pros* and *cons* for each of them, is an interesting and elevating speculation; but I fail to perceive that any one of them meets the difficulty with which I am now dealing. If

"The high that proved too high, the heroic for earth too hard,  
The passion that left the ground to lose itself in the sky"

present us only with an insoluble problem, I do not see how the philosopher is to fulfil the task he has undertaken of showing the effort after an "abiding self-satisfaction" to be rational. Nor, again, do I see how this is achieved by adopting the second alternative, and supposing that the personal self-conscious being, now designated as John or Thomas, is to be "for ever continued in God". For God, or the eternal consciousness—according to the definition



given in Book i.—is necessarily conceived as unalterable: it is eternally in reality all that the human spirit is in possibility, and there are no conceivable perfections that could be added to it; and the process of man's moral effort is surely futile if it is to end in nothing but the existence of that which exists already.<sup>1</sup> It may be said that objections of this kind may be brought against every philosophical theology, unless it diverges widely from religious common-sense: a plain man cannot but conceive the world-process, divinely ordered, as designed to bring about some good not yet realised which must be good from a divine or universal point of view, and yet he cannot conceive the Divine existence as at any time defective or wanting in any respect. I admit the force of the rejoinder; only, unlike Green, I should draw from it the inference that we ought not to use these theological notions, while yet unpurged of such palpable inconsistencies, as the basis of a philosophy of practice.

If, however, we leave on one side these theological difficulties, can we find the "abiding self-satisfaction" which a moral agent is supposed to seek, in the first of the alternatives above suggested—in the conception, that is, of a society of persons who somewhere, somehow, in the indefinite future, are to carry further that movement towards perfection which is so seriously impeded among the human beings whom we know? We might perhaps accept the solution—it being granted that the human spirit can be abidingly satisfied with movement instead of rest, progress instead of perfection—if a "better state of humanity" could be taken as a convertible term for the "better state of myself" at which, as a moral agent, I necessarily aim. In several passages Green seems to pass backwards and forwards between these two notions as if they might be used indifferently in his reasonings; but I cannot see how his moral psychology justifies this procedure. He has laid it down that "in all desire, or at any rate in all that amounts to will, it is self-satisfaction which the self-conscious agent necessarily seeks . . . a certain possible state of himself which in the gratification of the desire he seeks to reach" (pp. 177, 182): and since he has also explained how the most characteristic human desires depend on the conscious

<sup>1</sup> It may perhaps be said that I ought not to apply such a conception as "already existing" to a Being whose existence is expressly stated to be out of time. And, though I cannot profess to be able to reason about such a Being without tacitly conceiving it in some relation to time, I should not have ventured to use the phrase in the text if Green had not set me the example; *e.g.*, in speaking (p. 181) of a "best state of man already present to some divine consciousness".

distinction between the desirer's own individuality and that of other persons, I presume that we must maintain this distinction in interpreting the account above given of "all desire"; and therefore that the "better state of myself" which I necessarily seek cannot be the better state of any other person as such. But if so, we must know exactly how the one comes to be identified or indissolubly connected with the other under the comprehensive notion of the "bettering of man" or "humanity"; by what logical process we pass from the form of unqualified egoism under which the true end of the moral agent is represented to us on one page, to the unmediated universalism which we find suddenly substituted for it on another. I admit, of course, that the Divine Spirit, so far as it can be rightly conceived to aim at the realisation or reproduction of itself in men, must be conceived as aiming at its realisation in "persons," not in "this person," in humanity, not in me; but this only brings out more forcibly the difference that has to be bridged over between the aim of my one indivisible conscious self at its own satisfaction, and this aim of the Divine Spirit at a satisfaction or realisation which may just as well be attained in anyone else as in me. The mere fact that I am aware of myself as a self-distinguishing consciousness and attribute a similar consciousness to other men, does not necessarily make me regard their good as my own; some rational transition is still needed between the recognition of them as ends to themselves, and the recognition of them as ends to myself.

Can this transition be obtained by dwelling on the essential sociality of men, the universal or normal implication, through sympathy, of each one's interest or good with the interests of some others—according to the plain man's conception of 'interest' no less than the philosopher's? In some parts of his discussion (*e.g.*, in Book iii., ch. 3) Green seems to rely to some extent on this line of reasoning, with which the looser optimism of eighteenth-century moralists appears to have been often entirely satisfied; but I think that an exact consideration of it will show its inadequacy to establish the required conclusion. For granting all that is claimed, it only proves that I cannot realise good for myself without promoting the good of others in some degree; it does not show that my own good is in any sense identical with the good of others who are to live after me, so that it will "abide" in another form when my individual existence has terminated. And even if we give up the characteristic of "permanence" and merely consider whether my good during life can be identified with the good of humanity at large, I

still fail to see how this identification can be justified by anything that we know of the essential sociality of ordinary human beings. The "better state of himself" as conceived even by a voluptuary, who aims at dining well, is a social state: his dinner must be a convivial dinner if it is to be good; but it does not follow that he contemplates the waiters who hand round the dishes as ends-in-themselves or has any interest in future good dinners of which he will not partake. This is a coarse illustration; but the proposition that it illustrates seems to me equally, if less palpably, true of all the ordinary exercises and functions of cultivated social existence: the mere fact that I am a social being, that my life is meager and starved if I do not enlarge it by sympathy, and live the life of the community of which I am a member, does not necessarily constitute the good of humanity my good: it brings me a certain way towards this, but it has not necessarily any force or tendency to carry me the rest of the way. Granting that "to any one actuated by it the idea of perfection for himself will involve the idea of a perfection for all other beings, *so far as he finds the thought of their being perfect necessary to his own satisfaction,*" it remains true that to most persons the dissatisfaction caused by the idea of the imperfection of other beings, not connected with them by some special bond of sympathy, is at any rate an evil very faintly perceptible; and the question why in this case they should sacrifice any material part of their own good or perfection to avoid it remains unanswered.

I shall be told, perhaps, that the true good of man is so constituted that no competition can possibly arise between the good of one individual and the good of any other. And, doubtless, Green often affirms with sufficient distinctness that "the idea of a true good does not admit of the distinction between good for self and good for others". I think, however, that he does not steadily keep before his mind the gulf that he has placed between himself and common-sense by the adoption of this important proposition; and that, in consequence, he wastes his energies in trying to establish the untenable paradox that civil society is "founded on the idea" of a common good of this kind. He admits, indeed, that "we are very far, in our ordinary estimates of good, whether for ourselves or for others, from keeping such a standard before us . . . the conviction of the community of good for all men has little positive influence over our practical judgments"; good being, in fact, "sought in objects which admit of being competed for". But he does not seem to see that the acceptance of this proposed

standard would radically alter the common notions of virtue, even the notions to which he himself adheres most unquestioningly in his delineation of the moral ideal. Consider, for example, his description of the ideally just man, who is "so over-curious, as it seems to the ordinary man of the world, in inquiring, as to any action that may suggest itself to him, whether the benefit which he might gain by it for himself or for some one in whom he is interested would be gained at the expense of anyone else"; and so determined not to "promote his own wellbeing or that of one whom he loves or likes, from whom he has received service or expects it, at the cost of impeding in any way the wellbeing of one who is nothing to him as a man, or whom he involuntarily dislikes" (p. 244). Surely all this scrupulous investigation, all this resolute impartiality, implies that, in the opinion of Green's ideally just man, it is at least possible that he and his friends may be benefited at the expense of others, that the promotion of one's own wellbeing may really involve the cost of impeding the wellbeing of others: in short, that good really consists—at least to some extent—in "objects that admit of being competed for". How, after writing this description of an ideally just man, Green could go on to say that "the distinction of good for self and good for others has never entered into that idea of a true good upon which moral judgments are founded," I cannot imagine. That the distinction ought to be banished from our moral judgments is an intelligible proposition—though I think a moralist who makes it is rather bound to reconstruct our notions of justice and injustice, and show us the form they will take when the distinction is eliminated—but the statement that it has "never entered in" I contemplate with simple amazement.

So again, the "habitual self-denial," the "self-sacrificing will" which form an essential element of Green's moral ideal, seem to me notions with regard to which Kant's question *Quid juris?* is very obviously raised by Green's theory of the true good; and the question one that never finds an answer. If all self-conscious agents are always aiming each at his own good or self-satisfaction, and the most virtuous man only differs from the most vicious in that he seeks it with a truer insight into its nature, how can he—in the strictness of philosophical discourse—be said to "deny" or "sacrifice" himself in so seeking it? What he denies is not "himself"—according to Green's psychology as expounded in Book ii.—but those "impulses," "influences," or "tendencies" due to his animal soul with which

he does *not* identify himself,<sup>1</sup> "by which he is consciously affected but which are not he"; and which Green, indeed, with a certain eccentricity of terminology, is reluctant even to call "his desires". I trust the reader will not think that I am disputing about words; the question, I take it, is not of language but of the correctness of a certain psychological analysis; I seem to discern, in Green's account of moral action, pagan or neo-pagan forms of ethical thought combined with Christian or post-Christian forms without any proper philosophical reconciliation.

It may be said, however, that these objections are purely formal, or at least that they do not affect the substance of our author's own doctrine: let us leave them, therefore, and try if, when we examine in detail the content of Green's conception of a "true good" for the individual, we find it really so constituted that it cannot possibly come into competition with the true good of any other individual. It is difficult to see how this can be maintained with reference to the wide ideal of human perfection which is put forward in many passages of the treatise. The "realisation of human capabilities" at which we ought to aim is repeatedly stated to include "art and science" as well as "specifically moral virtues": we must suppose "all that is now inchoate in the way of art and knowledge" to have reached completion in it (p. 309): the development of arts and sciences is "a necessary constituent" of any life which "the educated citizen of Christendom" presents to himself as one in which he can find satisfaction (p. 415). But if I am right in thinking the development of artistic faculty and taste a part of my true good, I surely cannot be wrong in regarding the latter as including "objects that admit of being competed for," so long as the material conditions of our spiritual existence remain at all like what they are at present: indeed I should have thought that a writer like Green, who steadily refuses to take a hedonistic view of ordinary human aims and efforts, must regard the "realisation of scientific and artistic capacities," taken in a wide sense, as constituting the main motive of the keen struggle for material wealth which educated and refined persons generally feel themselves bound to keep up, for their children even more than for themselves. The thoughtful trader knows that wealth will enable him to provide himself and those he loves with books, pictures, prolonged education, varied travel, opportunities of intellectual society: and, knowing this, he allows himself to adopt methods of dealing which sometimes, perhaps, are hardly compatible with Green's ideal of justice. Simi-

<sup>1</sup> Cf. especially Bk. ii. ch. 2, p. 151.

larly the hardest choice which Christian self-denial imposes is the preference of the work apparently most socially useful to the work apparently most conducive to the agent's own scientific and æsthetic development.<sup>1</sup>

It may be replied that Art and Science are good, but Virtue better; that the self-devotion which leads a man to postpone to duty the fullest possible realisation of his scientific or artistic faculties is an exercise in which a fuller development of his nature as a whole is attained. I cannot conceive any empirical criterion of "fulness of development" by which this could be made to appear even probable as a universal proposition: but if we grant it to be true, in all cases in which the occasion for such a sacrifice may be presented, it can only be because the superiority in importance of the "specifically moral virtues," as compared with

All other skills and gifts to culture dear,

is held to be so great that the alternatives may be regarded as practically incommensurable. But if this be so, it seems to me that the promotion of the specifically moral virtues—considering the amount that remains to be done in this direction—ought in consistency to occupy so large a share of the practical philanthropist's attention that Green's inclusion of Art and Science will turn out to have hardly any real significance. In short Green seems to me to have unconsciously tried to get the advantages of two distinct and incompatible conceptions of human good: the one liberally comprehensive, but palpably admitting competition, the other non-competitive but stoically or puritanically narrow.

If, again, we concentrate our attention on the narrower conception of "specifically moral virtue," we find a similar difficulty in combining, as Green wishes us to do, formal and material criteria of virtuous action: nor do I think that matters are improved by the trenchant and dogmatic solution of the difficulty which Green here offers. Sometimes the formal criterion is put forward in language which would satisfy the most orthodox Kantian: "the only good," we are told, "which is really common to all who pursue it is that which consists in the universal will to be good" (p.

<sup>1</sup> I think Green unconsciously evades the difficulty which this choice presents, on his theory, when he speaks (pp. 292-3) of "the conscientious man sacrificing *personal pleasure* in satisfaction of the claims of human brotherhood . . . the good citizen has no leisure to think of developing his own faculties of *enjoyment*". Of course his good man, being anti-hedonistic, has no theoretical difficulty in sacrificing his own pleasure or enjoyment—or indeed that of anyone else: but we may still ask whether and why and how far he is called upon to sacrifice the realisation of his scientific and artistic capabilities.

262): the good will is "the one unconditional good . . . the end by reference to which we estimate the effects of an action" (p. 316). On the other hand, it is explained that the "good will" must not be understood to be "a will possessed by some abstract idea of goodness or moral law," which would "amount to a paralysis of the will for all effectual application to great objects of human interest". We conclude therefore that a will is not good, as with Kant, merely through its motive being pure regard for duty, but through its leading to good effects; and accordingly Green expressly says that a man "cannot have been good unless he has done what is good in result" (p. 332). It immediately occurs to us that, if this be true, in order to be good a man must have more than a mere will to be good; his zeal must be according to knowledge; he must have the power of foreseeing what actions will lead to good results. "A dominant interest in the perfection of mankind" will avail him little, if he erroneously supposes that it may be best promoted by a free use of dynamite. And besides mere knowledge there are various other qualities, caution, presence of mind, instinctive sympathy and tact, &c., the want of which, as is commonly thought, may seriously impair the good effects of the most well-intentioned acts. How then can we say that a good will is the "one unconditional good"? Green meets this difficulty by dogmatically enunciating that "there is no real reason to doubt that the good or evil in the motive of an action is exactly measured by the good or evil in its consequences as rightly estimated" (p. 320). "With the whole spiritual history of the action before us on the one side, with the whole sum and series of its effects before us on the other, we should presumably see that just so far as a good will . . . has had more or less to do with bringing the action about, there is more or less good . . . in its effects."

Nothing that can be called evidence is offered on behalf of this startling presumption, and I cannot conjecture on what grounds Green considered himself justified in thus dogmatically affirming it: especially when I find him saying later on that it is "*obvious* that the exact measure in which my conduct has fallen short of . . . perfection," in any particular action, "cannot be speculatively ascertained, till we can see all moral effects in their causes". If it is obviously impossible to ascertain how far the effects of any action are good, how can I possibly tell that they are certain to be exactly as good as the agent's motives were? The perplexity is made greater when Green goes on to admit



expressly (p. 334) that evil consequences of actions may have been due to a "want of the requisite knowledge and ability to foresee" (pp. 333, 4); without expressly maintaining or even implying that such ignorance and want of foresight are always traceable to want of good will. The perplexity reaches its height when we consider wherein the goodness of these good effects consists and how it is to be known. It must ultimately lie, as Green repeatedly tells us, in the tendency of the immediate consequences of actions to promote good character, that "perfection of mankind of which the essence is a good will on the part of all persons". It is true that this promotion can be only indirect, since "every one must make his character for himself. All that one man can do to make another better is to remove obstacles and supply conditions favourable to the formation of a good character". Still it remains true that the promotion of a good character in others and ourselves must, according to Green, be the sole ultimate end and standard of the goodness of the effects of our actions. On the other hand, Green explains in another passage (pp. 318, 19) that "we are on very uncertain ground" when we try, in judging the actions of contemporaries, to "ascertain the state of character on the part of the agents which the actions represent": and hence concludes that it is wiser "to confine ourselves to measuring the value of actions by their effects without reference to the character of the agents". But, as we have seen, these effects can only be effects on the character of other persons; and since, I presume, our judgments as to effects on character must ultimately be inferred from observations of conduct, there would seem to be precisely the same kind of difficulty in measuring the value of actions by their effects as there is in trying to ascertain the character of the agent; only that in the former case the unknown quantity comes in at a later stage of the calculation.

I cannot but think that these and other fundamental difficulties of method would have pressed themselves more strongly on Green's attention, and would therefore have obtained from him at least a consistent solution, if he had ever felt strongly the practical importance of improving men's knowledge or reasoned conviction as to what they ought to do. But—in face of the vehement jar and conflict of principles and methods continually exhibited by contemporary schools and sects of social reformers, whose sincerity and earnestness cannot be doubted—he remains firmly persuaded that practically the tendency of actions to produce a perfection of human society will be "within the ken of any dispassionate and considerate man"; and hence, though he



recognises that it is the function of philosophy to supply men with a "*rationale* of the various duties" prescribed to them, I cannot perceive that the enthusiasm for human wellbeing which the whole treatise breathes has actually impelled him to furnish such a *rationale*, or even to provide his readers with an outline of a coherent method by which a system of duties could be philosophically worked out. There is much instructive description and discussion, in the concluding Book of the treatise, of the general attitude which a moral man should adopt in dealing with practical problems, much subtle analysis and distinction of different elements presented for his consideration; but if the reader expects to be guided to a cogently reasoned solution of any such problems—proceeding from unambiguous ethical premisses to definite practical conclusions—the expectation will hardly be fulfilled.

This, at least, is the conclusion at which I have arrived, after a careful perusal of the treatise: but I expect that it will be widely disputed. Considering the growing prevalence of the manner of thought of which Green was a leading representative, the great influence exercised by himself personally, the amount of close and powerful reasoning which his book contains, and the singularly elevated and inspiring ethical mood which pervades it from first to last—it is hardly possible that such a work should not meet with many readers to whom it will give, as a whole, more intellectual satisfaction than I have been able to find in it. Indeed, had I thought otherwise, it would have seemed to me more suitable—as it would certainly have been more consonant with my own feelings—to treat this posthumous book in a less polemical manner; to dwell more upon its literary merits, and upon those aspects or elements of its doctrine with which I am in cordial sympathy. But, regarding the treatise as one about which our ethical discussion is likely for some time to turn, I have thought it best to urge the fundamental difficulties that I find in its teachings as frankly and fully as I should have done if the author had been living to reply. There are many, I doubt not, ready—if they should think it needful—to come (as Plato says) "to the aid of the orphaned doctrine, the father of which had he lived would have struck many a good stroke in its behalf": or let me rather say—since he never wrote for victory—that he would have set himself to remove such difficulties as he thought worthy of consideration in the candid, earnest, careful, exhaustive style of controversy which was peculiarly his own. That this source of further instruction is now for ever closed to us, no one can regret more sincerely than the writer of this article.

## II.—WHAT IS AN EMOTION ?

By Professor WILLIAM JAMES.

THE physiologists who, during the past few years, have been so industriously exploring the functions of the brain, have limited their attempts at explanation to its cognitive and volitional performances. Dividing the brain into sensorial and motor centres, they have found their division to be exactly paralleled by the analysis made by empirical psychology, of the perceptive and volitional parts of the mind into their simplest elements. But the *æsthetic* sphere of the mind, its longings, its pleasures and pains, and its emotions, have been so ignored in all these researches that one is tempted to suppose that if either Dr. Ferrier or Dr. Munk were asked for a theory in brain-terms of the latter mental facts, they might both reply, either that they had as yet bestowed no thought upon the subject, or that they had found it so difficult to make distinct hypotheses, that the matter lay for them among the problems of the future, only to be taken up after the simpler ones of the present should have been definitively solved.

And yet it is even now certain that of two things concerning the emotions, one must be true. Either separate and special centres, affected to them alone, are their brain-seat, or else they correspond to processes occurring in the motor and sensory centres, already assigned, or in others like them, not yet mapped out. If the former be the case we must deny the current view, and hold the cortex to be something more than the surface of "projection" for every sensitive spot and every muscle in the body. If the latter be the case, we must ask whether the emotional "process" in the sensory or motor centre be an altogether peculiar one, or whether it resembles the ordinary perceptive processes of which those centres are already recognised to be the seat. The purpose of the following pages is to show that the last alternative comes nearest to the truth, and that the emotional brain-processes not only resemble the ordinary sensorial brain-processes, but in very truth *are* nothing but such processes variously combined. The main result of this will be to simplify our notions of the possible complications of brain-physiology, and to make us see that we have already a brain-scheme in our hands whose appli-

cations are much wider than its authors dreamed. But although this seems to be the chief result of the arguments I am to urge, I should say that they were not originally framed for the sake of any such result. They grew out of fragmentary introspective observations, and it was only when these had already combined into a theory that the thought of the simplification the theory might bring to cerebral physiology occurred to me, and made it seem more important than before.

I should say first of all that the only emotions I propose expressly to consider here are those that have a distinct bodily expression. That there are feelings of pleasure and displeasure, of interest and excitement, bound up with mental operations, but having no obvious bodily expression for their consequence, would, I suppose, be held true by most readers. Certain arrangements of sounds, of lines, of colours, are agreeable, and others the reverse, without the degree of the feeling being sufficient to quicken the pulse or breathing, or to prompt to movements of either the body or the face. Certain sequences of ideas charm us as much as others tire us. It is a real intellectual delight to get a problem solved, and a real intellectual torment to have to leave it unfinished. The first set of examples, the sounds, lines, and colours, are either bodily sensations, or the images of such. The second set seem to depend on processes in the ideational centres exclusively. Taken together, they appear to prove that there are pleasures and pains inherent in certain forms of nerve-action as such, wherever that action occur. The case of these feelings we will at present leave entirely aside, and confine our attention to the more complicated cases in which a wave of bodily disturbance of some kind accompanies the perception of the interesting sights or sounds, or the passage of the exciting train of ideas. Surprise, curiosity, rapture, fear, anger, lust, greed, and the like, become then the names of the mental states with which the person is possessed. The bodily disturbances are said to be the "manifestation" of these several emotions, their "expression" or "natural language"; and these emotions themselves, being so strongly characterised both from within and without, may be called the *standard* emotions.

Our natural way of thinking about these standard emotions is that the mental perception of some fact excites the mental affection called the emotion, and that this latter state of mind gives rise to the bodily expression. My thesis on the contrary is that *the bodily changes follow directly the PERCEPTION of the exciting fact, and that our feeling of the*

*same changes as they occur is the emotion.* Common sense says, we lose our fortune, are sorry and weep; we meet a bear, are frightened and run; we are insulted by a rival, are angry and strike. The hypothesis here to be defended says that this order of sequence is incorrect, that the one mental state is not immediately induced by the other, that the bodily manifestations must first be interposed between, and that the more rational statement is that we feel sorry because we cry, angry because we strike, afraid because we tremble, and not that we cry, strike, or tremble, because we are sorry, angry, or fearful, as the case may be. Without the bodily states following on the perception, the latter would be purely cognitive in form, pale, colourless, destitute of emotional warmth. We might then see the bear, and judge it best to run, receive the insult and deem it right to strike, but we could not actually *feel* afraid or angry.

Stated in this crude way, the hypothesis is pretty sure to meet with immediate disbelief. And yet neither many nor far-fetched considerations are required to mitigate its paradoxical character, and possibly to produce conviction of its truth.

To begin with, readers of this Journal do not need to be reminded that the nervous system of every living thing is but a bundle of predispositions to react in particular ways upon the contact of particular features of the environment. As surely as the hermit-crab's abdomen presupposes the existence of empty whelk-shells somewhere to be found, so surely do the hound's olfactories imply the existence, on the one hand, of deer's or foxes' feet, and on the other, the tendency to follow up their tracks. The neural machinery is but a hyphen between determinate arrangements of matter outside the body and determinate impulses to inhibition or discharge within its organs. When the hen sees a white oval object on the ground, she cannot leave it; she must keep upon it and return to it, until at last its transformation into a little mass of moving chirping down elicits from her machinery an entirely new set of performances. The love of man for woman, or of the human mother for her babe, our wrath at snakes and our fear of precipices, may all be described similarly, as instances of the way in which peculiarly conformed pieces of the world's furniture will fatally call forth most particular mental and bodily reactions, in advance of, and often in direct opposition to, the verdict of our deliberate reason concerning them. The labours of Darwin and his successors are only just beginning to reveal the universal parasitism of each special creature upon other special things,

and the way in which each creature brings the signature of its special relations stamped on its nervous system with it upon the scene.

Every living creature is in fact a sort of lock, whose wards and springs presuppose special forms of key,—which keys however are not born attached to the locks, but are sure to be found in the world near by as life goes on. And the locks are indifferent to any but their own keys. The egg fails to fascinate the hound, the bird does not fear the precipice, the snake waxes not wroth at his kind, the deer cares nothing for the woman or the human babe. Those who wish for a full development of this point of view, should read Schneider's *Der thierische Wille*,—no other book shows how accurately anticipatory are the actions of animals, of the specific features of the environment in which they are to live.

Now among these nervous anticipations are of course to be reckoned the emotions, so far as these may be called forth directly by the perception of certain facts. In advance of all experience of elephants no child can but be frightened if he suddenly find one trumpeting and charging upon him. No woman can see a handsome little naked baby without delight, no man in the wilderness see a human form in the distance without excitement and curiosity. I said I should consider these emotions only so far as they have bodily movements of some sort for their accompaniments. But my first point is to show that their bodily accompaniments are much more far-reaching and complicated than we ordinarily suppose.

In the earlier books on Expression, written mostly from the artistic point of view, the signs of emotion visible from without were the only ones taken account of. Sir Charles Bell's celebrated *Anatomy of Expression* noticed the respiratory changes; and Bain's and Darwin's treatises went more thoroughly still into the study of the visceral factors involved,—changes in the functioning of glands and muscles, and in that of the circulatory apparatus. But not even a Darwin has exhaustively enumerated *all* the bodily affections characteristic of any one of the standard emotions. More and more, as physiology advances, we begin to discern how almost infinitely numerous and subtle they must be. The researches of Mosso with the plethysmograph have shown that not only the heart, but the entire circulatory system, forms a sort of sounding-board, which every change of our consciousness, however slight, may make reverberate. Hardly a sensation comes to us without sending waves of

alternate constriction and dilatation down the arteries of our arms. The blood-vessels of the abdomen act reciprocally with those of the more outward parts. The bladder and bowels, the glands of the mouth, throat, and skin, and the liver, are known to be affected gravely in certain severe emotions, and are unquestionably affected transiently when the emotions are of a lighter sort. That the heart-beats and the rhythm of breathing play a leading part in all emotions whatsoever, is a matter too notorious for proof. And what is really equally prominent, but less likely to be admitted until special attention is drawn to the fact, is the continuous co-operation of the voluntary muscles in our emotional states. Even when no change of outward attitude is produced, their inward tension alters to suit each varying mood, and is felt as a difference of tone or of strain. In depression the flexors tend to prevail; in elation or belligerent excitement the extensors take the lead. And the various permutations and combinations of which these organic activities are susceptible, make it abstractly possible that no shade of emotion, however slight, should be without a bodily reverberation as unique, when taken in its totality, as is the mental mood itself.

The immense number of parts modified in each emotion is what makes it so difficult for us to reproduce in cold blood the total and integral expression of any one of them. We may catch the trick with the voluntary muscles, but fail with the skin, glands, heart, and other viscera. Just as an artificially imitated sneeze lacks something of the reality, so the attempt to imitate an emotion in the absence of its normal instigating cause is apt to be rather "hollow".

The next thing to be noticed is this, that every one of the bodily changes, whatsoever it be, is *felt*, acutely or obscurely, the moment it occurs. If the reader has never paid attention to this matter, he will be both interested and astonished to learn how many different local bodily feelings he can detect in himself as characteristic of his various emotional moods. It would be perhaps too much to expect him to arrest the tide of any strong gust of passion for the sake of any such curious analysis as this; but he can observe more tranquil states, and that may be assumed here to be true of the greater which is shown to be true of the less. Our whole cubic capacity is sensibly alive; and each morsel of it contributes its pulsations of feeling, dim or sharp, pleasant, painful, or dubious, to that sense of personality that every one of us unfailingly carries with him. It is surprising what little items give accent to these complexes of sensibility.

When worried by any slight trouble, one may find that the focus of one's bodily consciousness is the contraction, often quite inconsiderable, of the eyes and brows. When momentarily embarrassed, it is something in the pharynx that compels either a swallow, a clearing of the throat, or a slight cough; and so on for as many more instances as might be named. Our concern here being with the general view rather than with the details, I will not linger to discuss these but, assuming the point admitted that every change that occurs must be felt, I will pass on.<sup>1</sup>

I now proceed to urge the vital point of my whole theory, which is this. If we fancy some strong emotion, and then try to abstract from our consciousness of it all the feelings of its characteristic bodily symptoms, we find we have nothing left behind, no "mind-stuff" out of which the emotion can be constituted, and that a cold and neutral state of intellectual perception is all that remains. It is true, that although most people, when asked, say that their introspection verifies this statement, some persist in saying theirs does not. Many cannot be made to understand the question. When you beg them to imagine away every feeling of laughter and of tendency to laugh from their consciousness of the ludicrousness of an object, and then to tell you what the feeling of its ludicrousness would be like, whether it be anything more than the perception that the object belongs to the class "funny," they persist in replying that the thing proposed is a physical impossibility, and that they always *must* laugh, if they see a funny object. Of course the task proposed is not the practical one of seeing a ludicrous object and annihilating one's tendency to laugh. It is the purely speculative one of subtracting certain elements of feeling from an emotional state supposed to exist in its fulness, and saying what the residual elements are. I cannot help thinking that all who rightly apprehend this problem will agree with the proposition above laid down. What kind of an emotion of fear would be left, if the feelings

<sup>1</sup> Of course the physiological question arises, *how* are the changes felt?—*after* they are produced, by the sensory nerves of the organs bringing back to the brain a report of the modifications that have occurred? or *before* they are produced, by our being conscious of the outgoing nerve-currents starting on their way downward towards the parts they are to excite? I believe all the evidence we have to be in favour of the former alternative. The question is too minute for discussion here, but I have said something about it in a paper entitled "The Feeling of Effort," in the *Anniversary Memoirs of the Boston Natural History Society*, 1880 (translated in *La Critique Philosophique* for that year, and summarised in *MIND* XX., 582). See also G. E. Müller's *Grundlegung der Psychophysik*, § 110.



neither of quickened heart-beats nor of shallow breathing, neither of trembling lips nor of weakened limbs, neither of goose-flesh nor of visceral stirrings, were present, it is quite impossible to think. Can one fancy the state of rage and picture no ebullition of it in the chest, no flushing of the face, no dilatation of the nostrils, no clenching of the teeth, no impulse to vigorous action, but in their stead limp muscles, calm breathing, and a placid face? The present writer, for one, certainly cannot. The rage is as completely evaporated as the sensation of its so-called manifestations, and the only thing that can possibly be supposed to take its place is some cold-blooded and dispassionate judicial sentence, confined entirely to the intellectual realm, to the effect that a certain person or persons merit chastisement for their sins. In like manner of grief: what would it be without its tears, its sobs, its suffocation of the heart, its pang in the breast-bone? A feelingless cognition that certain circumstances are deplorable, and nothing more. Every passion in turn tells the same story. A purely disembodied human emotion is a nonentity. I do not say that it is a contradiction in the nature of things, or that pure spirits are necessarily condemned to cold intellectual lives; but I say that for *us*, emotion dissociated from all bodily feeling is inconceivable. The more closely I scrutinise my states, the more persuaded I become, that whatever moods, affections, and passions I have, are in very truth constituted by, and made up of, those bodily changes we ordinarily call their expression or consequence; and the more it seems to me that if I were to become corporeally anæsthetic, I should be excluded from the life of the affections, harsh and tender alike, and drag out an existence of merely cognitive or intellectual form. Such an existence, although it seems to have been the ideal of ancient sages, is too apathetic to be keenly sought after by those born after the revival of the worship of sensibility, a few generations ago.

But if the emotion is nothing but the feeling of the reflex bodily effects of what we call its "object," effects due to the connate adaptation of the nervous system to that object, we seem immediately faced by this objection: most of the objects of civilised men's emotions are things to which it would be preposterous to suppose their nervous systems connately adapted. Most occasions of shame and many insults are purely conventional, and vary with the social environment. The same is true of many matters of dread and of desire, and of many occasions of melancholy and regret. In these cases, at least, it would seem that the



ideas of shame, desire, regret, &c., must first have been attached by education and association to these conventional objects before the bodily changes could possibly be awakened. And if in *these* cases the bodily changes follow the ideas, instead of giving rise to them, why not then in all cases ?

To discuss thoroughly this objection would carry us deep into the study of purely intellectual *Æsthetics*. A few words must here suffice. We will say nothing of the argument's failure to distinguish between the idea of an emotion and the emotion itself. We will only recall the well-known evolutionary principle that when a certain power has once been fixed in an animal by virtue of its utility in presence of certain features of the environment, it may turn out to be useful in presence of other features of the environment that had originally nothing to do with either producing or preserving it. A nervous tendency to discharge being once there, all sorts of unforeseen things may pull the trigger and let loose the effects. That among these things should be conventionalities of man's contriving is a matter of no psychological consequence whatever. The most important part of my environment is my fellow-man. The consciousness of his attitude towards me is the perception that normally unlocks most of my shames and indignations and fears. The extraordinary sensitiveness of this consciousness is shown by the bodily modifications wrought in us by the awareness that our fellow-man is noticing us *at all*. No one can walk across the platform at a public meeting with just the same muscular innervation he uses to walk across his room at home. No one can give a message to such a meeting without organic excitement. "Stage-fright" is only the extreme degree of that wholly irrational personal self-consciousness which every one gets in some measure, as soon as he feels the eyes of a number of strangers fixed upon him, even though he be inwardly convinced that their feeling towards him is of no practical account.<sup>1</sup> This being so, it is not surprising that the additional persuasion that my fellow-man's attitude means either well or ill for me, should awaken stronger emotions still. In primitive societies "Well" may mean handing me a piece of beef, and "Ill" may mean aiming a blow at my skull. In our "cultured

<sup>1</sup> Let it be noted in passing that this personal self-consciousness seems an altogether bodily affair, largely a consciousness of our attitude, and that, like other emotions, it reacts on its physical condition, and leads to modifications of the attitude,—to a certain rigidity in most men, but in children to a regular twisting and squirming fit, and in women to various gracefully shy poses.

age," "Ill" may mean cutting me in the street, and "Well," giving me an honorary degree. What the action itself may be is quite insignificant, so long as I can perceive in it intent or *animus*. That is the emotion-arousing perception; and may give rise to as strong bodily convulsions in me, a civilised man experiencing the treatment of an artificial society, as in any savage prisoner of war, learning whether his captors are about to eat him or to make him a member of their tribe.

But now, this objection disposed of, there arises a more general doubt. Is there any evidence, it may be asked, for the assumption that particular perceptions *do* produce widespread bodily effects by a sort of immediate physical influence, antecedent to the arousal of an emotion or emotional idea?

The only possible reply is, that there is most assuredly such evidence. In listening to poetry, drama, or heroic narrative, we are often surprised at the cutaneous shiver which like a sudden wave flows over us, and at the heart-swelling and the lachrymal effusion that unexpectedly catch us at intervals. In listening to music, the same is even more strikingly true. If we abruptly see a dark moving form in the woods, our heart stops beating, and we catch our breath instantly and before any articulate idea of danger can arise. If our friend goes near to the edge of a precipice, we get the well-known feeling of "all-overishness," and we shrink back, although we positively *know* him to be safe, and have no distinct imagination of his fall. The writer well remembers his astonishment, when a boy of seven or eight, at fainting when he saw a horse bleed. The blood was in a bucket, with a stick in it, and, if memory does not deceive him, he stirred it round and saw it drip from the stick with no feeling save that of childish curiosity. Suddenly the world grew black before his eyes, his ears began to buzz, and he knew no more. He had never heard of the sight of blood producing faintness or sickness, and he had so little repugnance to it, and so little apprehension of any other sort of danger from it, that even at that tender age, as he well remembers, he could not help wondering how the mere physical presence of a painful of crimson fluid could occasion in him such formidable bodily effects.

Imagine two steel knife-blades with their keen edges crossing each other at right angles, and moving too and fro. Our whole nervous organisation is "on-edge" at the thought; and yet what emotion can be there except the unpleasant nervous feeling itself, or the dread that more of it may come?

The entire fund and capital of the emotion here is the senseless bodily effect the blades immediately arouse. This case is typical of a class: where an ideal emotion seems to precede the bodily symptoms, it is often nothing but a representation of the symptoms themselves. One who has already fainted at the sight of blood may witness the preparations for a surgical operation with uncontrollable heart-sinking and anxiety. He anticipates certain feelings, and the anticipation precipitates their arrival. I am told of a case of morbid terror, of which the subject confessed that what possessed her seemed, more than anything, to be the fear of fear itself. In the various forms of what Professor Bain calls "tender emotion," although the appropriate object must usually be directly contemplated before the emotion can be aroused, yet sometimes thinking of the symptoms of the emotion itself may have the same effect. In sentimental natures, the thought of "yearning" will produce real "yearning". And, not to speak of coarser examples, a mother's imagination of the caresses she bestows on her child may arouse a spasm of parental longing.

In such cases as these, we see plainly how the emotion both begins and ends with what we call its effects or manifestations. It has no mental *status* except as either the presented feeling, or the idea, of the manifestations; which latter thus constitute its entire material, its sum and substance, and its stock-in-trade. And these cases ought to make us see how in all cases the feeling of the manifestations may play a much deeper part in the constitution of the emotion than we are wont to suppose.

If our theory be true, a necessary corollary of it ought to be that any voluntary arousal of the so-called manifestations of a special emotion ought to give us the emotion itself. Of course in the majority of emotions, this test is inapplicable; for many of the manifestations are in organs over which we have no volitional control. Still, within the limits in which it can be verified, experience fully corroborates this test. Everyone knows how panic is increased by flight, and how the giving way to the symptoms of grief or anger increases those passions themselves. Each fit of sobbing makes the sorrow more acute, and calls forth another fit stronger still, until at last repose only ensues with lassitude and with the apparent exhaustion of the machinery. In rage, it is notorious how we "work ourselves up" to a climax by repeated outbreaks of expression. Refuse to express a passion, and it dies. Count ten before venting your anger, and its occasion seems ridiculous.

Whistling to keep up courage is no mere figure of speech. On the other hand, sit all day in a moping posture, sigh, and reply to everything with a dismal voice, and your melancholy lingers. There is no more valuable precept in moral education than this, as all who have experience know: if we wish to conquer undesirable emotional tendencies in ourselves, we must assiduously, and in the first instance cold-bloodedly, go through the *outward motions* of those contrary dispositions we prefer to cultivate. The reward of persistency will infallibly come, in the fading out of the sullenness or depression, and the advent of real cheerfulness and kindness in their stead. Smooth the brow, brighten the eye, contract the dorsal rather than the ventral aspect of the frame, and speak in a major key, pass the genial compliment, and your heart must be frigid indeed if it do not gradually thaw!

The only exceptions to this are apparent, not real. The great emotional expressiveness and mobility of certain persons often lead us to say "They would feel more if they talked less". And in another class of persons, the explosive energy with which passion manifests itself on critical occasions, seems correlated with the way in which they bottle it up during the intervals. But these are only eccentric types of character, and within each type the law of the last paragraph prevails. The sentimentalist is so constructed that "gushing" is his or her normal mode of expression. Putting a stopper on the "gush" will only to a limited extent cause more "real" activities to take its place; in the main it will simply produce listlessness. On the other hand the ponderous and bilious "slumbering volcano," let him repress the expression of his passions as he will, will find them expire if they get no vent at all; whilst if the rare occasions multiply which he deems worthy of their outbreak, he will find them grow in intensity as life proceeds.

I feel persuaded there is no real exception to the law. The formidable effects of suppressed tears might be mentioned, and the calming results of speaking out your mind when angry and having done with it. But these are also but specious wanderings from the rule. Every perception must lead to *some* nervous result. If this be the normal emotional expression, it soon expends itself, and in the natural course of things a calm succeeds. But if the normal issue be blocked from any cause, the currents may under certain circumstances invade other tracts, and there work different and worse effects. Thus vengeful brooding may replace a burst of indignation; a dry heat may consume the

frame of one who fain would weep, or he may, as Dante says, turn to stone within ; and then tears or a storming-fit may bring a grateful relief. When we teach children to repress their emotions, it is not that they may *feel* more, quite the reverse. It is that they may *think* more ; for to a certain extent whatever nerve-currents are diverted from the regions below, must swell the activity of the thought-tracts of the brain.<sup>1</sup>

The last great argument in favour of the priority of the bodily symptoms to the felt emotion, is the ease with which we formulate by its means pathological cases and normal cases under a common scheme. In every asylum we find examples of absolutely unmotivated fear, anger, melancholy, or conceit ; and others of an equally unmotivated apathy which persists in spite of the best of outward reasons why it should give way. In the former cases we must suppose the nervous machinery to be so "labile" in some one emotional direction, that almost every stimulus, however inappropriate, will cause it to upset in that way, and as a consequence to engender the particular complex of feelings of which the psychic body of the emotion consists. Thus, to take one special instance, if inability to draw deep breath, fluttering of the heart, and that peculiar epigastric change felt as "precordial anxiety," with an irresistible tendency to take a somewhat crouching attitude and to sit still, and with perhaps other visceral processes not now known, all spontaneously occur together in a certain person ; his feeling of their combination *is* the emotion of dread, and he is the victim of what is known as morbid fear. A friend who has had occasional attacks of this most distressing of all maladies, tells me that in his case the whole drama seems to centre about the region of the heart and respiratory apparatus, that his main effort during the attacks is to get control of his inspirations and to slow his heart, and that the moment he attains to breathing deeply and to holding himself erect, the dread, *ipso facto*, seems to depart.<sup>2</sup>

<sup>1</sup> This is the opposite of what happens in injuries to the brain, whether from outward violence, inward rupture or tumor, or mere starvation from disease. The cortical permeability seems reduced, so that excitement, instead of propagating itself laterally through the ideational channels as before, tends to take the downward track into the organs of the body. The consequence is that we have tears, laughter, and temper-fits, on the most insignificant provocation, accompanying a proportional feebleness in logical thought and the power of volitional attention and decision.

<sup>2</sup> It must be confessed that there are cases of morbid fear in which objectively the heart is not much perturbed. These however fail to prove anything against our theory, for it is of course possible that the cortical

The account given to Brachet by one of his own patients of her opposite condition, that of emotional insensibility, has been often quoted, and deserves to be quoted again:—

"I still continue (she says) to suffer constantly; I have not a moment of comfort, and no human sensations. Surrounded by all that can render life happy and agreeable, still to me the faculty of enjoyment and of feeling is wanting—both have become physical impossibilities. In everything, even in the most tender caresses of my children, I find only bitterness. I cover them with kisses, but there is something between their lips and mine; and this horrid something is between me and all the enjoyments of life. My existence is incomplete. The functions and acts of ordinary life, it is true, still remain to me; but in every one of them there is something wanting—to wit, the feeling which is proper to them, and the pleasure which follows them. . . . Each of my senses, each part of my proper self, is as it were separated from me and can no longer afford me any feeling; this impossibility seems to depend upon a void which I feel in the front of my head, and to be due to the diminution of the sensibility over the whole surface of my body, for it seems to me that I never actually reach the objects which I touch. . . . I feel well enough the changes of temperature on my skin, but I no longer experience the internal feeling of the air when I breathe. . . . All this would be a small matter enough, but for its frightful result, which is that of the impossibility of any other kind of feeling and of any sort of enjoyment, although I experience a need and desire of them that render my life an incomprehensible torture. Every function, every action of my life remains, but deprived of the feeling that belongs to it, of the enjoyment that should follow it. My feet are cold, I warm them, but gain no pleasure from the warmth. I recognise the taste of all I eat, without getting any pleasure from it. . . . My children are growing handsome and healthy, everyone tells me so, I see it myself, but the delight, the inward comfort I ought to feel, I fail to get. Music has lost all charm for me, I used to love it dearly. My daughter plays very well, but for me it is mere noise. That lively interest which a year ago made me hear a delicious concert in the smallest air their fingers played,—that thrill, that general vibration which made me shed such tender tears,—all that exists no more."<sup>1</sup>

Other victims describe themselves as closed in walls of

centres normally percipient of dread as a complex of cardiac and other organic sensations due to real bodily change, should become *primarily* excited in brain-disease, and give rise to an hallucination of the changes being there,—an hallucination of dread, consequently, coexistent with a comparatively calm pulse, &c. I say it is possible, for I am ignorant of observations which might test the fact. Trance, ecstasy, &c., offer analogous examples,—not to speak of ordinary dreaming. Under all these conditions one may have the liveliest subjective feelings, either of eye or ear, or of the more visceral and emotional sort, as a result of pure nerve-central activity, with complete peripheral repose. Whether the subjective strength of the feeling be due in these cases to the actual energy of the central disturbance, or merely to the narrowing of the field of consciousness, need not concern us. In the asylum cases of melancholy, there is usually a narrowing of the field.

<sup>1</sup> Quoted by Semal: *De la Sensibilité générale dans les Affections mélancoliques*, Paris, 1876, pp. 130-135.

ice or covered with an india-rubber integument, through which no impression penetrates to the sealed-up sensibility.

If our hypothesis be true, it makes us realise more deeply than ever how much our mental life is knit up with our corporeal frame, in the strictest sense of the term. Rapture, love, ambition, indignation, and pride, considered as feelings, are fruits of the same soil with the grossest bodily sensations of pleasure and of pain. But it was said at the outset that this would be affirmed only of what we then agreed to call the "standard" emotions; and that those inward sensibilities that appeared devoid at first sight of bodily results should be left out of our account. We had better, before closing, say a word or two about these latter feelings.

They are, the reader will remember, the moral, intellectual, and æsthetic feelings. Concords of sounds, of colours, of lines, logical consistencies, teleological fitnesses, affect us with a pleasure that seems ingrained in the very form of the representation itself, and to borrow nothing from any reverberation surging up from the parts below the brain. The Herbartian psychologists have tried to distinguish feelings due to the *form* in which ideas may be arranged. A geometrical demonstration may be as "pretty," and an act of justice as "neat" as a drawing or a tune, although the prettiness and neatness seem here to be a pure matter of sensation, and there to have nothing to do with sensation. We have then, or some of us seem to have, genuinely *cerebral* forms of pleasure and displeasure, apparently not agreeing in their mode of production with the so-called "standard" emotions we have been analysing. And it is certain that readers whom our reasons have hitherto failed to convince, will now start up at this admission, and consider that by it we give up our whole case. Since musical perceptions, since logical ideas, can immediately arouse a form of emotional feeling, they will say, is it not more natural to suppose that in the case of the so-called "standard" emotions, prompted by the presence of objects or the experience of events, the emotional feeling is equally immediate, and the bodily expression something that comes later and is added on ?

But a sober scrutiny of the cases of pure cerebral emotion gives little force to this assimilation. Unless in them there actually be coupled with the intellectual feeling a bodily reverberation of some kind, unless we actually laugh at the neatness of the mechanical device, thrill at the justice of the act, or tingle at the perfection of the musical form, our mental condition is more allied to a judgment of *right* than



to anything else. And such a judgment is rather to be classed among awarenesses of truth: it is a *cognitive* act. But as a matter of fact the intellectual feeling hardly ever does exist thus unaccompanied. The bodily sounding-board is at work, as careful introspection will show, far more than we usually suppose. Still, where long familiarity with a certain class of effects has blunted emotional sensibility thereto as much as it has sharpened the taste and judgment, we do get the intellectual emotion, if such it can be called, pure and undefiled. And the dryness of it, the paleness, the absence of all glow, as it may exist in a thoroughly expert critic's mind, not only shows us what an altogether different thing it is from the "standard" emotions we considered first, but makes us suspect that almost the entire difference lies in the fact that the bodily sounding-board, vibrating in the one case, is in the other mute. "Not so very bad" is, in a person of consummate taste, apt to be the highest limit of approving expression. "*Rien ne me choque*" is said to have been Chopin's superlative of praise of new music. A sentimental layman would feel, and ought to feel, horrified, on being admitted into such a critic's mind, to see how cold, how thin, how void of human significance, are the motives for favour or disfavour that there prevail. The capacity to make a nice spot on the wall will outweigh a picture's whole content; a foolish trick of words will preserve a poem; an utterly meaningless fitness of sequence in one musical composition set at naught any amount of "expressiveness" in another.

I remember seeing an English couple sit for more than an hour on a piercing February day in the Academy at Venice before the celebrated "Assumption" by Titian; and when I, after being chased from room to room by the cold, concluded to get into the sunshine as fast as possible and let the pictures go, but before leaving drew reverently near to them to learn with what superior forms of susceptibility they might be endowed, all I overheard was the woman's voice murmuring: "What a *deprecatory* expression her face wears! What self-abnegation! How *unworthy* she feels of the honour she is receiving!" Their honest hearts had been kept warm all the time by a glow of spurious sentiment that would have fairly made old Titian sick. Mr. Ruskin somewhere makes the (for him) terrible admission that religious people as a rule care little for pictures, and that when they do care for them they generally prefer the worst ones to the best. Yes! in every art, in every science, there is the keen perception of certain relations being *right* or not,



and there is the emotional flush and thrill consequent thereupon. And these are two things, not one. In the former of them it is that experts and masters are at home. The latter accompaniments are bodily commotions that they may hardly feel, but that may be experienced in their fulness by *Crétins* and Philistines in whom the critical judgment is at its lowest ebb. The "marvels" of Science, about which so much edifying popular literature is written, are apt to be "caviare" to the men in the laboratories. Cognition and emotion are parted even in this last retreat,—who shall say that their antagonism may not just be one phase of the world-old struggle known as that between the spirit and the flesh?—a struggle in which it seems pretty certain that neither party will definitively drive the other off the field.

To return now to our starting-point, the physiology of the brain. If we suppose its cortex to contain centres for the perception of changes in each special sense-organ, in each portion of the skin, in each muscle, each joint, and each viscus, and to contain absolutely nothing else, we still have a scheme perfectly capable of representing the process of the emotions. An object falls on a sense-organ and is apperceived by the appropriate cortical centre ; or else the latter, excited in some other way, gives rise to an idea of the same object. Quick as a flash, the reflex currents pass down through their pre-ordained channels, alter the condition of muscle, skin and viscus ; and these alterations, apperceived like the original object, in as many specific portions of the cortex, combine with it in consciousness and transform it from an object-simply-apprehended into an object-emotionally-felt. No new principles have to be invoked, nothing is postulated beyond the ordinary reflex circuit, and the topical centres admitted in one shape or another by all to exist.

It must be confessed that a crucial test of the truth of the hypothesis is quite as hard to obtain as its decisive refutation. A case of complete internal and external corporeal anaesthesia, without motor alteration or alteration of intelligence except emotional apathy, would afford, if not a crucial test, at least a strong presumption, in favour of the truth of the view we have set forth ; whilst the persistence of strong emotional feeling in such a case would completely overthrow our case. Hysterical anaesthetics seem never to be complete enough to cover the ground. Complete anaesthetics from organic disease, on the other hand, are excessively rare. In the famous case of Remigius Leims, no mention is made by

the reporters of his emotional condition, a circumstance which by itself affords no presumption that it was normal, since as a rule nothing ever is noticed without a pre-existing question in the mind. Dr. Georg Winter has recently described a case somewhat similar,<sup>1</sup> and in reply to a question, kindly writes to me as follows:—"The case has been for a year and a half entirely removed from my observation. But so far as I am able to state, the man was characterised by a certain mental inertia and indolence. He was tranquil, and had on the whole the temperament of a phlegmatic. He was not irritable, not quarrelsome, went quietly about his farm-work, and left the care of his business and house-keeping to other people. In short, he gave one the impression of a placid countryman, who has no interests beyond his work." Dr. Winter adds that in studying the case he paid no particular attention to the man's psychic condition, as this seemed "*nebensächlich*" to his main purpose. I should add that the form of my question to Dr. Winter could give him no clue as to the kind of answer I expected.

Of course, this case proves nothing, but it is to be hoped that asylum-physicians and nervous specialists may begin methodically to study the relation between anæsthesia and emotional apathy. If the hypothesis here suggested is ever to be definitively confirmed or disproved it seems as if it must be by them, for they alone have the data in their hands.

P.S.—By an unpardonable forgetfulness at the time of despatching my MS. to the Editor, I ignored the existence of the extraordinary case of total anæsthesia published by Professor Strümpell in *Ziemssen's Deutsches Archiv für klinische Medizin* xxii., 321, of which I had nevertheless read reports at the time of its publication. [Cf. first report of the case in *MIND* X., 263, translated from *Pflüger's Archiv*. Ed.] I believe that it constitutes the only remaining case of the sort in medical literature, so that with it our survey is complete. On referring to the original, which is important in many connexions, I found that the patient, a shoemaker's apprentice of 15, entirely anæsthetic, inside and out, with the exception of one eye and one ear, had shown *shame* on the occasion of soiling his bed, and *grief*, when a formerly favourite dish was set before him, at the thought that he could no longer taste its flavour. As Dr. Strümpell seemed however to have paid no special attention to his psychic states, so far as these are matter for our theory, I wrote to him in a few words what the essence of the theory was, and asked him to say whether he felt sure the grief and shame mentioned were real feelings in the boy's mind, or only the reflex manifestations provoked by certain perceptions, manifestations that an outside observer might note, but to which the boy himself might be insensible.

<sup>1</sup> "Ein Fall von allgemeiner Anæsthesie," *Inaugural-Dissertation*. Heidelberg, Winter, 1882.

Dr. Strümpell has sent me a very obliging reply, of which I translate the most important passage.

"I must indeed confess that I naturally failed to institute with my *Anæsthetiker* observations as special as the sense of your theory would require. Nevertheless I think I can decidedly make the statement, that he was by no means completely lacking in emotional affections. In addition to the feelings of *grief* and *shame* mentioned in my paper, I recall distinctly that he showed *e.g.*, *anger*, and frequently quarrelled with the hospital attendants. He also manifested *fear* lest I should punish him. In short, I do not think that my case speaks exactly in favour of your theory. On the other hand, I will not affirm that it positively refutes your theory. For my case was certainly one of a very centrally conditioned anaesthesia (perception-anaesthesia, like that of hysterics) and therefore the conduction of outward impressions may in him have been undisturbed."

I confess that I do not see the relevancy of the last consideration, and this makes me suspect that my own letter was too briefly or obscurely expressed to put my correspondent fully in possession of my own thought. For his reply still makes no explicit reference to anything but the outward manifestations of emotion in the boy. Is it not at least conceivable that, just as a stranger, brought into the boy's presence for the first time, and seeing him eat and drink and satisfy other natural necessities, would suppose him to have the feelings of hunger, thirst, &c., until informed by the boy himself that he did all these things with no feeling at all but that of sight and sound—is it not, I say, at least possible, that Dr. Strümpell, addressing no direct introspective questions to his patient, and the patient not being of a class from which one could expect voluntary revelations of that sort, should have similarly omitted to discriminate between a feeling and its habitual motor accompaniment, and erroneously taken the latter as proof that the former was there? Such a mistake is of course possible, and I must therefore repeat Dr. Strümpell's own words, that his case does not yet refute my theory. Should a similar case recur, it ought to be interrogated as to the inward emotional state that co-existed with the outward expressions of shame, anger, &c. And if it then turned out that the patient recognised explicitly the same mood of feeling known under those names in his former normal state, my theory would of course fall. It is, however, to me incredible that the patient should have an *identical* feeling, for the dropping out of the organic sounding-board would necessarily diminish its volume in some way. The teacher of Dr. Strümpell's patient found a mental deficiency in him during his anaesthesia, that may possibly have been due to the consequences resulting to his general intellectual vivacity from the subtraction of so important a mass of feelings, even though they were not the whole of his emotional life. Whoever wishes to extract from the next case of total anaesthesia the maximum of knowledge about the emotions, will have to interrogate the patient with some such notion as that of my article in his mind. We can define the pure psychic emotions far better by starting from such an hypothesis and modifying it in the way of restriction and subtraction, than by having no definite hypothesis at all. Thus will the publication of my article have been justified, even though the theory it advocates, rigorously taken, be erroneous. The best thing I can say for it is, that in writing it, I have almost persuaded *myself* it may be true.

### III.—LA RECTIFICATION DES ILLUSIONS PAR L'APPEL AUX SENS.

Par ALFRED BINET.

#### I.

LE moyen le plus simple et le plus sûr de découvrir une illusion des sens est de recourir à l'expérience. On entend par là le contrôle du sens qui paraît compromis, par un autre sens. Ainsi, dans la plupart des illusions d'optique, les erreurs de la vue sont découvertes par le toucher : une image produite par une lentille, et qui paraît réelle, est reconnue comme virtuelle, lorsque la main, en explorant le champ de la vision, ne rencontre pas de résistance au point de l'espace que l'image paraît occuper. Les illusions du toucher, à leur tour, peuvent être reconnues par l'œil, comme lorsque la vue distingue les deux pointes de compas assez rapprochées pour donner une sensation unique à la peau (expérience de Weber), ou que la vue reconnaît l'existence d'une boule unique là où le toucher croit en sentir deux (expérience d'Aristote).

Avant d'analyser ces procédés de contrôle, il faut s'arrêter à une observation préliminaire ; c'est que les sensations fournies par les différents sens diffèrent entre elles qualitativement. Il n'existe aucun rapport d'aucune sorte entre des couleurs, par exemple, et des impressions de résistance. Comment donc peut-on concevoir que le témoignage d'un de nos sens soit capable de corriger ou seulement de contredire celui des autres ? Comment l'œil, qui n'est sensible qu'à la lumière, et qui, de quelque façon qu'on l'excite, ne répond jamais que par des sensations lumineuses, peut-il être en désaccord avec le toucher, dont l'objet propre est la pression, la température, l'état physique des corps ? Où rien n'est commun il ne peut y avoir opposition.

D'ailleurs, pour comprendre qu'un combat fut possible entre des sens différents, il faudrait admettre que les sens peuvent se tromper. C'était l'opinion des anciens ; on reconnaît aujourd'hui que dans les illusions la faute n'est pas imputable à l'organe sensitif, mais à l'interprétation de l'esprit. L'illusion est un phénomène mixte, composé par l'association d'impressions réelles et d'images mentales ; les impressions des sens sont toujours ce qu'elles doivent être, étant donné la nature de l'excitant extérieur et l'état de l'organe sensitif. Ce sont les images mentales qui sont

fausses, de sorte que l'illusion peut être définie : une représentation inexacte d'un phénomène extérieur, à la suite d'une excitation sensorielle ; ou bien une synthèse mal faite ; ou encore (si l'on considère la perception exacte comme le résultat d'une inférence) un raisonnement faux, un sophisme. Quelle que soit la définition qu'on adopte, on voit que la correction d'une illusion par l'appel aux sens ne peut mettre en conflit deux sens différents ; le combat s'engage entre un sens et une opération de l'esprit.

L'observation directe des faits confirme cette proposition. Prenons l'expérience d'Aristote, qui consiste en ceci : si on croise l'index et le medius l'un sur l'autre et qu'on roule entre ces deux doigts une petite boule, on croit (en fermant les yeux) toucher deux boules distinctes, l'une en dehors de l'index, l'autre en dedans du medius. Cette illusion tactile tient à ce que la boule unique impressionne en même temps le bord radial de l'index et le bord cubital du medius. Or, dans la position normale des doigts, l'œil perçoit deux objets et non un seul, quand ces deux bords sont impressionnés simultanément ; c'est l'habitude qui engendre cette tendance au dédoublement. Mais il suffit d'ouvrir les yeux et de regarder ses doigts pour que l'illusion des deux boules cesse aussitôt.

L'intervention de la vue corrige l'illusion à laquelle donnent lieu des impressions du toucher ; mais peut-on dire pour cela que la vue corrige le toucher ? assurément non, car le toucher n'a jamais été en défaut. L'illusion a consisté dans une interprétation inexacte des sensations tactiles ; l'esprit a eu le tort de combiner avec ces sensations l'image mentale de deux boules occupant deux positions différentes, l'une en dehors de l'index, l'autre en dedans du medius. C'est cette image mentale qui est fausse ; or, comme cette image est *visuelle*, il est naturel que la vue puisse la corriger. Lorsque nous constatons, les yeux ouverts, que nous tenons entre les mains un seul objet, la sensation visuelle entre en conflit avec une idée visuelle.

Il existe un grand nombre d'illusions tactiles dont la rectification par la vue s'explique de la même façon ; telles sont l'illusion d'humidité qu'on éprouve en passant la main sur une surface froide et polie, les illusions si variées que provoquent les sensations subjectives de chaud, de froid, de picotement, de fourmillement etc. Ces sensations anormales éveillent par association des représentations visuelles que la vue corrige et détruit. Considérée dans sa source, l'illusion est tactile ; considérée dans sa nature, elle est visuelle.

Quand c'est le toucher qui rectifie l'erreur des yeux comme

dans les illusions d'optique, on a le phénomène inverse. Ajustons<sup>1</sup> dans une monture de lunette deux prismes de verre, dont les angles réfringents soient de  $16^{\circ}$  à  $18^{\circ}$ , et tournés à gauche; vus à travers ces deux prismes, tous les objets du champ visuel paraissent déplacés vers la gauche. Mais la main peut rectifier cette fausse apparence en constatant que les objets n'occupent pas le point du champ visuel où on les localise. Dans ce cas, peut-on dire que le toucher rectifie la vue? Non, car la vue ne nous trompe pas; aucun sens ne nous trompe. L'œil ne possède pas la faculté innée d'apprécier la position relative des corps dans l'espace; et par conséquent la fausse appréciation de cette position ne provient pas de l'œil, mais de l'esprit. L'illusion a consisté dans le fait de combiner avec les sensations visuelles une notion fausse de la direction des objets; cette notion, cette représentation de l'esprit est, dans sa nature, tactile et musculaire; elle est formée par le renouvellement d'impressions du toucher et du sens musculaire qui ont été éprouvées à une époque antérieure. Il est donc naturel que la main puisse rectifier une telle représentation quand elle est fausse.

On constate que lorsqu'on a répété l'expérience du prisme un certain nombre de fois, en touchant les objets sous la direction du regard, on parvient à tenir compte de la déviation des rayons lumineux; en recommençant l'expérience avec les yeux fermés, on ne passe plus à côté des objets, comme en débutant, mais on les atteint exactement. Lorsqu'on est arrivé à ce point, qu'on retire la main, et après avoir regardé un objet pendant quelque temps sans l'intermédiaire des prismes, qu'on essaye de le saisir en tenant les yeux fermés: la main passe à droite.

Il y a un point délicat dans l'interprétation de cette série d'expériences. On pourrait croire que nous avons cessé d'apprécier la position exacte de notre main et la direction exacte de la ligne qu'elle parcourt, et que c'est à ce prix que l'accord s'est établi entre le toucher et la perception visuelle. Cela reviendrait à admettre que la représentation mentale de la direction des objets, au lieu d'être corrigée par l'expérience réelle de cette direction, peut fausser et dénaturer cette expérience. Helmholtz a pris de soin de réfuter cette objection.<sup>2</sup> Il a montré que c'est la représentation mentale qui reçoit, à la suite des tâtonnements de la main pour saisir l'objet, la modification qui la fait correspondre à la position vraie des

<sup>1</sup> Helmholtz, *Optique physiologique*, p. 765 de la traduction française.

<sup>2</sup> Helmholtz, *ibid.*

objets, position que le sens du toucher ne cesse pas de déterminer exactement. En effet, il suffit, lorsqu'on s'est habitué en présence des prismes à atteindre les objets avec la main droite, de faire l'expérience avec la main gauche, en fermant les yeux ; bien que cette main n'est pas encore paru dans le champ visuel, elle atteint alors les objets avec exactitude et sans hésitation.

Cet exemple dispensera d'insister sur la rectification d'autres illusions d'optique, qui consistent dans la localisation erronée d'un point lumineux, et qui tiennent à la déviation des rayons par réflexion, réfraction, diffraction, défaut d'accommodation etc.

On peut encore dire un mot du cas où, suivant le langage ordinaire, un sens se corrige lui-même. Parmi toutes les observations qu'on pourrait citer à ce sujet, nous en choisirons une qui a l'avantage de présenter à notre examen des illusions d'un genre particulier ; ce sont des illusions actives, spontanées, produites par le jeu de l'imagination, et non, comme les précédentes, par l'action uniforme de l'expérience passée. Souvent la disposition d'une étoffe, les plis d'une draperie éclairée par une lumière pâle et douteuse provoquent l'apparition d'une forme fantastique. On rapporte que Sir Walter Scott, dont l'esprit était fortement excité par le récit de la mort de Byron, vit, en se rendant dans sa salle à manger, l'image de son ami qui se reproduisait devant lui. Frappé du soin minutieux avec lequel l'imagination avait reproduit les particularités de l'habillement et la pose du grand poète, il s'arrêta quelques instants ; puis, s'avancant plus près, il reconnut que cette vision était due à l'arrangement d'une tapisserie placée sur un écran. Dans les cas de ce genre, la vue claire et nette de la tapisserie entre en conflit avec la forme fantastique, la contredit, l'enraye et la fait finalement disparaître. La sensation visuelle détruit la représentation visuelle.

C'est par une action analogue que les personnes saines d'esprit ou les aliénés qui sont poursuivis, à l'arrivée de la nuit, par des illusions pénibles de la vue, font cesser ces phénomènes et se débarrassent de leurs visions en allumant leur bougie.

En résumé, la même règle se vérifie partout : l'état de conscience corrigé et l'état de conscience correcteur appartiennent toujours au même organe sensoriel. Ce qui jette de l'obscurité sur ce sujet, c'est l'habitude prise de rapporter l'illusion à l'organe dont les sensations la provoquent. Ainsi, l'illusion qui se forme dans l'expérience des deux doigts croisés sur une boule est appelée une illusion du toucher ;



les illusions d'optique sont appelées des illusions de la vue. Mais en réalité le caractère illusoire réside dans la partie mentale du phénomène, et non dans la sensation. L'illusion de l'expérience d'Aristote est visuelle ; les illusions d'optique sont généralement des erreurs du toucher et du sens musculaire. Si cette nouvelle terminologie était adoptée, on comprendrait sans explication que les illusions de la vue (expérience d'Aristote) sont corrigées uniquement par la vue, et celles du toucher et du sens musculaire (illusions d'optique) par la main.

Un autre caractère de ces procédés de rectification, c'est d'opposer l'un à l'autre deux ordres différents de connaissances, le raisonnement<sup>1</sup> et l'expérience directe. L'esprit se reporte de la connaissance représentative à la connaissance présentative, de ce qui est dérivé à ce qui est primitif, de la copie au modèle, de l'idée à la sensation. Nous faisons par instinct ce qu'on fait méthodiquement dans les sciences expérimentales, toutes les fois qu'il y a doute sur une question de fait : nous recourons à l'observation de la nature.

Il ne faut pas exagérer, cependant, le caractère de cette sorte de régression du composé au simple. L'appel au sens est une opération de la pensée qui dépasse toujours la sensation brute. Lorsque la vue intervient—dans l'expérience d'Aristote—pour constater l'existence de la boule unique, la sensation visuelle qu'on éprouve s'accompagne nécessairement de représentations de forme, de position etc. ; l'état de conscience correcteur est un état mixte ; il est mixte à un double titre ; d'abord parcequ'il est formé d'éléments sensoriels et d'éléments idéaux, et ensuite parceque ces éléments appartiennent à des sens différents. L'état de conscience corrigé a une composition analogue ; et il serait facile de démontrer que dans cette même expérience la représentation fausse des deux boules fait intervenir non seulement une idée visuelle, mais des idées de forme, de position etc. On voit combien ces phénomènes doivent être complexes. On ne peut pas se contenter de dire avec certains auteurs que la rectification d'une illusion se fait par la juxtaposition de deux états de conscience contradictoires. Cette formule est trop simple. Les deux états de conscience ne sont pas homogènes. L'idée de deux boules est, répétons le, une résultante de représentations de la vue, du toucher, du sens musculaire etc. ; et la vue de la boule unique est encore une résultante, qui diffère de la précédente en ce qu'elle contient

<sup>1</sup> Rappelons que l'illusion des sens est le résultat d'un raisonnement inconscient.

à titre d'élément intégrant une impression sensorielle de la vue. Quand ces deux groupes d'états de conscience entrent en conflit, nous avons seulement conscience de la rectification totale, c'est à dire de ce fait que la notion de deux boules est chassée par la notion d'une boule unique; mais il doit se passer en même temps une série de rectifications partielles; chaque élément d'un groupe réagit sur l'élément correspondant de l'autre groupe, le visuel avec le visuel, le tactile avec le tactile, le musculaire avec le musculaire etc.; et ce sont ces petites rectifications partielles qui en s'ajoutant les unes aux autres forment le phénomène de la rectification totale, le seul qui arrive à la conscience.

## II.

Il faut maintenant étudier la nature et le mécanisme de la rectification, considérée comme opération psychologique. Cette étude présente plusieurs difficultés; avant de l'aborder directement, rappelons les recherches que M. Ribot a faites sur le phénomène qu'il a appelé le "pouvoir d'arrêt de la volonté" car il y a peut-être quelque analogie entre l'action inhibitoire d'une volition sur une autre volition, et l'action encore inconnue d'une sensation sur le développement d'une représentation mentale.<sup>1</sup>

Ce qu'on découvre tout d'abord, ce n'est pas une analogie, c'est une différence profonde. Le conflit de deux impulsions motrices contraires, qu'il s'agisse d'un cas banal, comme d'arrêter le rire, le baillement, la toux, ou d'un cas plus important, comme de maîtriser un violent accès de colère, aboutit toujours à l'un ou l'autre de ces deux résultats: un arrêt—ou la production d'un mouvement nouveau, différent du mouvement suspendu. Le conflit de deux états intellectuels, tel qu'on le voit se manifester dans la correction d'une illusion des sens, ne peut produire qu'un changement dans l'état de croyance; il aboutit, selon les cas, à l'indécision, au doute, ou à la négation de la croyance primitive et à l'établissement d'une croyance contraire. Ainsi d'une part, il y a un effet moteur; d'autre part, il y a un effet intellectuel: la différence est très nette. Mais une étude attentive des phénomènes montre que c'est là une de ces différences de surface dont il ne faut pas tenir compte, et qu'une lutte entre deux idées doit avoir la même nature et reconnaître le même mécanisme qu'une lutte entre deux volitions.

En effet, l'illusion des sens—et cela est vrai de toutes les opérations intellectuelles—ne forme pas un acte complet;

<sup>1</sup> Ribot, *Maladies de la Volonté*, p. 13.

c'est un commencement, un début. C'est la loi que tout état de conscience tend à se dépenser en mouvement, que toute opération de la pensée a pour but l'action. Considérée à ce point de vue, la perception externe est la première partie d'un acte moteur, qui a le caractère d'une adaptation de l'individu à son milieu; et l'illusion des sens, qui est une perception fausse, est la première partie d'un acte d'adaptation mal conçu, mal dirigé, avorté. Il en résulte que la correction d'une illusion des sens, par la modification qu'elle apporte dans les actes de l'individu, produit un phénomène d'arrêt.

On va faire un faux pas, sous la pression d'une illusion de la vue; si avec la canne on rectifie l'illusion avant qu'elle ne passe à l'acte, le faux pas est évité; la sensation reçue par l'intermédiaire de la canne, en supprimant la représentation fausse, en supprime du même coup l'effet moteur; elle empêche donc, par voie indirecte, un mouvement qui allait se produire; il y a bien là un phénomène d'arrêt. Seulement l'arrêt a lieu plus tôt que dans le cas où l'on réprime un mouvement par un acte de volonté; le processus psychomoteur est suspendu dans sa phase psychique, au lieu d'être suspendu dans sa phase motrice; c'est pour cette raison seule que l'arrêt a la forme d'une négation, c'est à dire d'un phénomène intellectuel, au lieu de consister dans le phénomène moteur d'une suspension de mouvement.

L'analogie s'étend encore plus loin. M. Ribot a très bien montré que le pouvoir volontaire d'arrêt n'est pas un fait primitif, mais un état de formation secondaire; on peut en dire autant du pouvoir de contrôler le résultat de la perception externe; ce sont là des appareils de perfectionnement surajoutés. Dans sa forme primitive, l'intelligence n'est que force impulsive; l'étude des petits enfants, des sauvages et des animaux montre avec quelle rapidité et quelle fatalité chaque combinaison de la pensée se traduit en acte. Il y a dans ces natures primitives un besoin irrésistible de croire qui est corrélatif au besoin d'agir. A ce moment, le réflexe est véritablement le type de la vie de relation.

Mais l'organisme intellectuel se perfectionne avec le temps, et le perfectionnement ne consiste pas seulement dans une complication supérieure de l'appareil déjà existant, mais encore dans une formation absolument nouvelle, le pouvoir de coordination et d'arrêt. Il faut bien concevoir que cette acquisition se fait dans deux sens à la fois, dans l'ordre de la connaissance et dans l'ordre de l'action; l'individu acquiert en même temps le pouvoir de ralentir, de suspendre, de coordonner ses mouvements et de les faire converger vers

un but choisi intentionnellement, et le pouvoir de diriger son activité intellectuelle, et de contrôler ses raisonnements et ses souvenirs en leur opposant d'autres raisonnements et d'autres souvenirs. Les deux acquisitions sont contemporaines. La conséquence la plus frappante de la première, c'est l'arrêt d'un mouvement; la conséquence la plus frappante de la seconde, c'est le doute.

De toutes ces analogies, on peut conclure avec une certaine sécurité que le fait intellectuel de la rectification et le fait moteur de la coordination et de l'arrêt sont deux actes qui reconnaissent le même mécanisme.

Ce mécanisme, quel est-il? La physiologie seule pourrait nous le dire, mais les éclaircissements qu'elle nous donne sont très vagues. On sait encore peu de chose sur ces questions de dynamique nerveuse. Dans ces derniers temps,<sup>1</sup> on est parvenu à démontrer expérimentalement qu'une excitation nerveuse peut être détruite par une autre excitation, et qu'une contraction musculaire produite par un agent chimique peut être suspendue par l'application des électrodes sur le muscle, et inversement. On peut supposer que le système nerveux est normalement le siège de phénomènes analogues, des processus physiologiques suspendus par des processus contraires. Nous rappelons en passant l'hypothèse déjà ancienne des centres d'arrêt, dont la fonction consisterait à modérer ou à supprimer complètement l'action des autres centres. Cette hypothèse a l'avantage d'expliquer pourquoi les reflexes spinaux augmentent d'intensité quand la moelle est soustraite à l'influence du cerveau, soit physiologiquement, pendant le sommeil, soit expérimentalement, par la décapitation de l'animal, soit pathologiquement, par l'effet d'une myélite transverse ou de toute autre lésion établissant une solution de continuité entre une partie de la moelle et l'encéphale. Dans les cas de ce genre, l'action modératrice des centres encéphaliques serait suspendue, et il se produirait un phénomène comparable à l'accélération des battements du cœur par la section des pneumogastriques. On pourrait supposer un mécanisme analogue pour expliquer l'antagonisme de deux états de conscience et la suppression de l'un par l'autre. Mais la donnée sur laquelle on s'appuierait manque de solidité, car l'existence des centres d'arrêt n'est rien moins que démontrée. Beaucoup de physiologistes, Vulpian entre autres, se sont toujours montrés les ennemis de cette hypothèse.<sup>2</sup>

<sup>1</sup> Bubnoff et Heidenhain, "Ueber Erregungs- und Hemmungs-Vorgänge" (*Pflüger's Archiv*, 1881).

<sup>2</sup> Consultez à ce sujet les auteurs cités par M. Ribot, p. 15 et seq., et les derniers travaux de Brown-Séquard.

Laissons là ce problème physiologique, et tenons nous en aux données de la psychologie. Ce qu'il y a de certain, c'est que lorsqu'une sensation contredit une représentation, le premier état de conscience chasse et supprime le second. La sensation occupe seule tout le champ de l'esprit. Quand je fixe les yeux sur mes deux doigts croisés, je vois qu'il n'y a qu'une boule, et je ne puis, au même moment, quelque effort que je fasse, en imaginer deux. Cette supériorité de la sensation sur l'image tient en partie à une différence dans leur nature physique. On admet généralement que le processus nerveux de la sensation occupe la même région centrale que le processus de l'image, mais qu'en outre le premier processus implique la mise en activité des parties périphériques du système nerveux (organes sensoriels terminaux et nerfs centripètes) tandis que le second n'implique rien de semblable. Cette différence dans l'étendue de la surface d'excitation explique bien—toutes choses égales d'ailleurs—pourquoi le processus sensoriel a plus d'énergie et d'intensité que le processus idéal.

L'état de conscience qui réussit, pour quelque cause que ce soit, à se maintenir seul dans le champ de l'esprit passe seul à l'acte et détermine seul la croyance. La psychologie peut encore nous apprendre quelque chose sur ce point. Cet état passe seul à l'acte, d'abord parceque c'est la loi que tout état se transforme en mouvement, et ensuite parcequ'ici rien n'entrave sa tendance motrice : l'état antagoniste a été vaincu. Il détermine seul la croyance, d'abord parceque c'est la loi que tout état, sensoriel ou idéal, vrai ou faux, est accompagné d'une croyance (au moins momentanée) à l'existence réelle de son objet,<sup>1</sup> et ensuite parcequ'aucune image antagoniste ne vient dans notre cas enrayer cet effet psychique.

Nous avons dans le sommeil hypnotique un état analogue, mais produit par des causes toutes différentes. Le sujet hypnotisé est complètement à la merci de son magnétiseur ; il pense, il sent et il fait tout ce que son magnétiseur lui ordonne de penser, de sentir et de faire. Pourquoi ? C'est que l'état de conscience qu'on éveille en lui par des suggestions de différente nature "régne seul dans la conscience endormie,"<sup>2</sup> aucun autre état ne l'entrave. Tous les éléments intellectuels, sensitifs et moteurs, conscients, subconscients et inconscients, dont la résultante constitue la personnalité

<sup>1</sup> Cette loi a été établie par Dugald Stewart, *Philosophie de l'esprit humain*, i., p. 107. Cf. Taine, *De l'Intelligence*, i., 89.

<sup>2</sup> Ribot, *loc. cit.*, p. 135 et seq.

à l'état normal, sont temporairement paralysés. Aussi l'état suggéré développe-t-il tous les effets qui sont inhérents à sa nature. A l'état normal, on arrive bien au même résultat final ; le travail de la réflexion et de la délibération aboutit au choix d'une représentation à l'exclusion des autres. Mais cette prépondérance d'une représentation unique ne tient pas, comme dans le somnambulisme, à ce que tout le reste de l'intelligence est engourdi ; elle tient à ce que toutes les représentations contraires ont été annihilées. Le résultat n'a été atteint qu'avec plus ou moins d'efforts, et après des phénomènes souvent compliqués, dont il nous reste à étudier le détail.

### III.

Le succès d'une rectification dépend de plusieurs conditions dont la première en importance est la nature propre de l'illusion à rectifier. Les auteurs qui ont écrit sur les illusions des sens ont remarqué que ces phénomènes peuvent être ramenés à deux types bien distincts. Il y a des illusions solides et durables, soutenues par l'action d'une longue expérience passée ; ce sont les illusions que M. Sully qualifie de *passives*. D'autres illusions sont éphémères, dues à une sorte de condescendance de l'esprit, à un relâchement de l'attention, ou à une action spontanée de l'imagination ; pour les opposer aux précédentes, le même auteur les appelle *actives*. Les premières représentent des états acquis d'ancienne date, inscrits dans l'organisme en traits profonds ; les secondes sont les états récents, peu organisés et peu stables. Si l'on se rappelle que l'illusion des sens se forme par un acte psychique d'interprétation comparable à un raisonnement, on pourra conclure de ces faits que les raisonnements, indépendamment de leur vérité ou de leur fausseté, ont une autre qualité, qu'on pourrait appeler *l'intensité*, que deux démonstrations, également vraies ou fausses, peuvent être inégalement fortes, et que leur force relative, si elle était susceptible de mesure, pourrait être évaluée en fraction. Sans pousser plus loin cette théorie, nous nous bornons à constater que l'expérience directe par les sens ne peut produire le même effet sur toutes les illusions. Nous allons voir qu'on peut classer les illusions en trois groupes, suivant que la réduction de la représentation mentale par la sensation est complète, partielle ou nulle.

(1) Le premier groupe est représenté par les illusions qui, une fois détruites, ne parviennent pas à se recomposer ; la représentation fausse est chassée de telle sorte qu'elle ne reparait plus dans la conscience ; le pouvoir de la sensation

atteint un maximum. C'est le cas des illusions actives en général. Nous pouvons prendre comme exemple les illusions qui se développent quand on s'égare dans un lieu inconnu ; après un petit nombre de détours, on perd toute notion exacte sur la direction des points cardinaux ; et on s'imagine qu'on se rapproche d'un lieu, au moment où l'on marche dans le sens opposé. Si l'individu rencontre un point de repère qui lui permette de s'orienter à nouveau, l'illusion est rectifiée et disparaît brusquement. Bien plus, la correction une fois faite, l'illusion devient une véritable impossibilité, qu'aucune effort d'esprit ne parvient à faire renaître.

Nous rapprocherons de cette illusion un autre phénomène qui paraît tenir aux mêmes causes : c'est une illusion qui repose sur une fausse appréciation des mouvements de la tête.<sup>1</sup> "On pratique dans le volet d'une chambre obscure une fente de 5 centimètres de long sur 2 de large, et formant le seul objet visible dans l'espace qui l'entoure. Quand, cette ligne éclairée étant verticale, l'observateur incline la tête vers l'épaule droite, la ligne paraît s'incliner en sens contraire, c'est à dire de gauche à droite et de haut en bas ; si l'observateur incline la tête vers l'épaule gauche, le mouvement apparent de la ligne change de sens ; il a toujours lieu en sens contraire du mouvement de la tête. . . . Lorsqu'on laisse pénétrer de la lumière dans la chambre en maintenant l'inclinaison de la tête, la ligne reprend sa position verticale." Il suffit de comparer cette illusion à la précédente pour voir jusqu'à quel point elles se ressemblent. Dans les deux cas il s'agit d'une fausse appréciation de la direction des objets ; dans les deux cas cette fausse appréciation dépend d'une fausse représentation des mouvements exécutés ; dans les deux cas, l'illusion est subordonnée à l'absence de points de repère visuels ; dans les deux cas enfin l'apparition d'un point de repère détruit brusquement l'illusion. (L'éclaircissement de la chambre obscure, dans la seconde expérience, ne permet d'apprécier la direction de la ligne lumineuse qu'en fournissant des points de repère.)

Helmholtz<sup>2</sup> attribue cette dernière illusion à une tendance que nous avons à considérer, dans l'obscurité, les inclinaisons latérales de la tête comme plus petites qu'elles ne sont en réalité. Nous pensons qu'on pourrait rattacher la première illusion à une cause analogue. Nous avons constaté expérimentalement que lorsqu'on change de direction, l'esprit à

<sup>1</sup> Cette illusion a été décrite pour la première fois par Aubert, *Virchow's Archiv für pathologische Anatomie und Physiologie*, xx.

<sup>2</sup> *Optique physiologique*, pp. 785 et 786.



une tendance, lorsqu'il apprécie le changement sans le secours de la vue, à diminuer la valeur de l'angle de rotation. Ce serait là, selon nous, une particularité de la conscience musculaire. Néanmoins, les faits que nous avons recueillis ne sont pas encore assez nombreux pour nous permettre de conclure.

L'illusion de direction permet de comprendre ce que c'est que le *vertige de direction*.<sup>1</sup> On a désigné par ce nom une sorte de saisissement à laquelle sont sujets des individus âgés et affaiblis, et quelquefois même des chasseurs expérimentés. Sous l'influence d'une sorte d'accès, les individus sont convaincus qu'ils vont dans une direction absolument contraire à celle qu'ils suivent réellement, et la vue des points de repère que leurs compagnons leur montrent afin de faire cesser leur erreur ne peut vaincre ce sentiment pénible de renversement. Il semble que ce vertige est simplement une illusion de direction qui au lieu de céder devant la preuve contraire persiste avec une force anormale. Il y a un nom pour les illusions de ce genre, on les appelle des hallucinations. Nous dirons donc que le vertige de direction est l'hallucination de la direction.

(2) Le deuxième groupe est le plus intéressant. Il contient les cas où l'illusion, quoique rectifiée, peut encore renaître quand on s'y prête en faisant un effort d'imagination, ou quand la sensation rectificatrice cesse de se faire sentir. Citons une dernière fois l'expérience d'Aristote. Nous sommes absolument incapables de nous représenter deux boules quand l'œil est ouvert et fixé sur la boule unique : mais dès que les yeux se ferment, les deux boules réapparaissent. En ouvrant et fermant alternativement les yeux, on peut se donner le spectacle d'une illusion alternativement détruite et renaissante.

Après avoir perdu un membre, les opérés ressentent des douleurs qu'ils rapportent à l'extrémité du membre absent, et ils sont obligés de constater avec la vue et avec la main que leur membre n'existe plus pour se débarrasser de cette illusion des sens. Mais la fausse localisation recommence souvent pendant la nuit ; ce n'est que peu à peu que le malade s'habitue à sa situation nouvelle. Fait curieux, à mesure que le temps s'écoule, la *sensation remonte* ; " elle est rapportée d'abord à un point moins éloigné, et finit en quelque sorte par s'appliquer sur l'extrémité des moignons ".<sup>2</sup> Il

<sup>1</sup> *Nature*, 17 avril, 1873, article de M. Henry Forde ; et *Revue Philosophique*, juillet, 1882, article de M. Viguier.

<sup>2</sup> Ball, *Revue Scientifique*, 1er mai, 1880.

y a là comme une sorte de compromis entre l'illusion et la rectification.<sup>1</sup> Beaucoup d'autres exemples pourraient être cités. Mais ceux que nous avons choisis suffisent pour faire comprendre la survivance de certaines illusions des sens. A quoi tient ce phénomène ? Sans doute à ce fait général que les éléments nerveux, après avoir agi d'une certaine manière, ont une tendance à reproduire la même action avec plus de facilité. Rappelons, à ce propos, des vérités banales : un raisonnement faux, une hypothèse absurde, un soupçon insensé ne sont pas absolument effacés et détruits par cela seul que l'esprit les a jugés à leur véritable valeur. Calomniez, a-t-on dit, il en reste toujours quelque chose.

(3) Dans le troisième groupe nous rangerons les illusions qui persistent à s'imposer après que l'esprit en a pénétré la cause. Ces illusions ont leur origine dans des habitudes acquises ; on pourrait les appeler normales, car elles sont partagées par tous les individus placés dans certaines circonstances. Telles sont les illusions d'optique dues aux phénomènes de réflexion, de réfraction et de diffraction, à la persistance ou à l'irradiation des images sur la rétine etc., les illusions de l'ouïe causées par la réflexion du son (erreur de localisation, écho), etc., etc.

M. Sully a fait une étude soigneuse de ces illusions, qu'il qualifie de *passives*, pour les opposer aux illusions *actives* naissant du jeu spontané de l'imagination. Dans les illusions passives l'esprit se laisse guider et dominer par la routine de ses habitudes ; il interprète la sensation conformément au cours ordinaire de son expérience, sans tenir compte des circonstances exceptionnelles où il se trouve. On pourrait définir, dit M. Sully,<sup>2</sup> le caractère logique de l'illusion passive en disant qu'elle ressemble à ce paralogisme qui tient à ce qu'on raisonne sur une généralisation approximative comme si c'était une vérité universelle.

Il ne semble pas que l'action directe des sens puisse détruire ces illusions. Le bâton à demi plongé dans l'eau continue à paraître brisé au point d'immersion, quoique le toucher témoigne qu'il est droit. L'apparence du bâton courbé n'est cependant qu'une représentation de l'esprit, et non, comme on pourrait le croire, une impression des sens ;

<sup>1</sup> Topffer, dans les *Nouvelles genevoises* (p. 396), décrit avec beaucoup d'agrément un fait du même genre. "N'êtes-vous jamais peur . . . le soir en vous couchant, lorsqu'un genou sur le lit, vous n'osiez retirer le pied, crainte que, de dessous, une main ? . . . Prenez la lumière, regardez bien : rien, personne. Posez la lumière, ne regardez plus : il y est de nouveau."

<sup>2</sup> *Illusions*, p. 242.

car bien que les rayons lumineux émis par l'objet fassent réellement un angle susceptible d'être projeté sur un plan, l'œil ne voit pas directement cet angle, il l'infère; et cette inférence vient de ce que l'esprit se laisse ici guider par cette vérité générale et non absolue que tout point lumineux est situé dans la direction des dernières ondes qui parviennent à l'œil. En d'autres termes, et sans entrer dans les détails, l'esprit qui voit le bâton courbé interprète certaines impressions visuelles qui sont le signe exact d'une courbure lorsque l'objet est situé tout entier dans un milieu homogène. Cette illusion remarquable ne cède pas à l'expérience du toucher qui la contredit.

On a voulu tirer de cette persistance de certaines illusions un argument en faveur de la théorie nativiste, d'après laquelle un grand nombre de particularités de nos perceptions—et notamment la perception de l'espace, la localisation des points lumineux dans le champ visuel etc.—auraient lieu par un mécanisme inné, antérieur à toute expérience, et lié fatalement à une disposition anatomique. Nous ne voulons pas traiter à fond une question qui se présente ici de biais. Notons seulement qu'il paraît aujourd'hui de plus en plus probable que l'habitude, l'éducation des sens, en un mot les opérations de l'esprit suffisent à expliquer la plupart des phénomènes, et que la théorie empiristique soutenue par Helmholtz gagne tous les jours du terrain.<sup>1</sup>

Et, de fait, ne voyons nous pas que pour peu qu'on s'y exerce, on parvient à triompher de quelques unes de ces illusions dites persistantes? N'avons-nous pas constaté (voir plus haut) qu'on peut s'habituer à localiser exactement les objets en les regardant à travers un prisme, et tenir compte de la déviation subie par les rayons lumineux? L'acquisition de cette perception ne fait-elle pas brèche à cette règle posée par Rouget<sup>2</sup> que les impressions visuelles sont reportées au dehors de la rétine dans la direction des axes prolongés des batonnets? Et n'en peut-on pas conclure que la règle de Rouget ne dépend pas d'une faculté innée de la rétine, puisque l'expérience peut la détruire? Ne voit-on pas les strabiques fusionner des images qui ne tombent pas sur des points identiques des deux rétines, etc. etc.? Il est probable que l'expérience a tout formé, et qu'une expérience contraire et suffisamment prolongée pourrait tout détruire.

Quoi qu'il en soit de ces problèmes, on peut dire des illu-

<sup>1</sup> *Physiol. opt.* Voyez toute la troisième partie, pour l'historique complet de la question, et la discussion de toutes les opinions.

<sup>2</sup> Voir Duval, *Structure et usage de la Rétine*, p. 107, en note, Paris, 1873.

sions passives que si l'expérience directe ne les détruit pas, l'esprit les corrige. En somme, c'est ce qui importe le plus. Il en est de ces erreurs des sens comme de quelques hallucinations auxquelles les malades ne peuvent pas se soustraire, mais dont ils reconnaissent la fausseté. La rectification n'est que partielle : elle laisse subsister intacte l'image sensible, mais cette image cesse de paraître objet réel et n'entraîne plus la croyance. La rectification a lieu, comme dit M. Taine,<sup>1</sup> au *second stade*.

Il nous reste à déterminer en quelques mots le caractère logique de la négation que le témoignage des sens oppose, dans les conditions que nous venons d'étudier, à une opération de la pensée. Les faits précédents ont l'avantage de traduire sous une forme expérimentale un principe abstrait qui a tenu une place considérable dans la philosophie antique, et qui reste aujourd'hui sinon le criterium de la vérité, du moins la condition du possible : le principe de contradiction. On peut l'énoncer de plusieurs manières. C'est une loi de notre intelligence,<sup>2</sup> dirons nous dans notre langage moderne et à notre point de vue psychologique, que certains états de conscience s'excluent. Nous ne pouvons concevoir une ligne comme étant à la fois droite et brisée, une surface comme étant à la fois carrée et triangulaire, un corps comme étant à la fois lourd et léger : ces termes impliquent contradiction. Or c'est bien ce même principe de contradiction qui est en jeu lorsqu'une représentation mentale est corrigée par l'intervention de la sensation. S'il y a conflit entre ces deux états de conscience, c'est parcequ'ils ne peuvent pas coexister, parcequ'ils s'excluent, en un mot parcequ'ils se contredisent. Le principe de contradiction pourrait s'appeler le principe d'antagonisme des états de conscience.

Quelles sont les conditions nécessaires pour que deux états forment deux notions contradictoires ? Il y en a trois : c'est que les deux états se rapportent au même objet, qu'ils appartiennent au même organe sensoriel, et qu'ils ne soient pas semblables. Ces trois conditions sont nécessaires et suffisantes.

#### IV.

Il est temps de procéder à la synthèse des faits qui viennent d'être analysés.

Le principe général qui domine notre matière, c'est que

<sup>1</sup> Taine, *De l'Intelligence*, t. i., p. 76, et *seq.*

<sup>2</sup> Taine, *De l'Intelligence*, t. i., p. 36.

toute opération de l'esprit a pour but l'action. La perception vraie et la perception fausse ne sont que les premières parties d'un phénomène qui, considéré dans son intégralité, est un processus d'adaptation. Ainsi comprise, la perception (vraie ou fausse) laisse facilement voir sa parenté avec le réflexe ; c'est un réflexe modifié et compliqué, dont le développement a eu lieu dans les deux sens à la fois. D'abord, dans le sens psychique (période centripète du réflexe) : le stimulus n'est pas une impression sensorielle, mais une représentation mentale qu'une impression sensorielle a provoquée. Ensuite, dans le sens moteur (période centrifuge du réflexe) : la réaction ne se compose pas d'un simple mouvement responsif, suffisant au cas où le stimulus agit directement sur le corps ; elle est formée d'une série de mouvements coordonnés en vue d'une fin, et adaptant l'organisme vis à vis d'un objet qui peut être éloigné dans l'espace et dans le temps.

Le réflexe représente une adaptation simple et bornée ; la perception, une adaptation plus complexe et plus générale.

Chez un grand nombre d'animaux, ces processus d'adaptation paraissent exister seuls et suffire à l'entretien de la vie de relation. Comme l'animal se meut toujours dans le même cercle et accomplit régulièrement les mêmes actes à la suite des mêmes incitations, il arrive facilement à faire bien un travail qui ne varie pas. On cite par exemple des insectes qui ne visitent jamais qu'une seule espèce de fleurs.<sup>1</sup> Dans ces conditions, l'adaptation atteint une perfection merveilleuse, qui a fait croire à la supériorité de l'instinct sur l'intelligence.<sup>2</sup>

Mais à mesure que le champ de la perception s'agrandit, que les facultés se développent et que l'adaptation, au lieu d'être uniforme, est obligée de se modifier sans cesse et de varier avec les conditions extérieures, les chances d'erreurs deviennent plus nombreuses. L'intelligence devient fragile par sa supériorité même. L'illusion est une cause de danger soit immédiat soit prochain, car le défaut d'adaptation dans l'ordre des connaissances entraîne presque toujours un défaut d'adaptation dans l'ordre de l'action. Il faut donc, de toute nécessité, que l'individu ait les moyens de reconnaître et de corriger ses erreurs, comme un organisme sain qui répare lui-même ses désordres et ses lésions. C'est à ce but que concourent, chez l'homme et chez les principaux ani-

<sup>1</sup> Lubbock, *Insectes et Fleurs*, p. 24.

<sup>2</sup> Nous n'insistons pas, n'ayant pas l'intention de faire ici de la psychologie animale ; mais nous devons rappeler que les réflexions précédentes s'appuient sur un très grand nombre de faits.

maux supérieurs, un ensemble de fonctions complexes qui dirigent et contrôlent les processus automatiques de la perception.

Les fonctions inférieures avaient toutes la forme impulsive, et conduisaient uniquement à l'action ; les fonctions directrices sont surtout des pouvoirs d'arrêt.

Nous avons étudié seulement les pièces les plus inférieures et les plus grossières de cet appareil de perfectionnement : la correction des illusions par l'appel aux sens. Essayons de montrer en quelques mots que cette correction constitue, par rapport à la perception, un état supérieur dans la hiérarchie des activités psychiques.

La suspension du processus psycho-moteur par l'appel aux sens est sans doute un phénomène assez simple, car l'action d'arrêt est produite par une incitation venue du dehors et non du dedans. La seule condition requise à cet effet, c'est que le processus qui doit être suspendu ne se dépense pas immédiatement au dehors en mouvement. La première condition de l'arrêt, c'est donc une question de temps. C'est dire que chez tous les individus dont les idées et les sentiments passent immédiatement à l'acte, comme les enfants, les sauvages, les personnes inéduquées et inéducables, l'arrêt est impossible.

De plus, le contrôle d'un sens par un autre, quand il n'est pas le fait du hasard, suppose que l'individu doute des apparences et cherche à vérifier si ce doute est fondé. Il y a là comme un rudiment de curiosité scientifique. L'opération de contrôle, prise en elle-même, est une véritable expérimentation.

Tous les moyens que l'esprit possède de corriger les illusions sont, nous le répétons, des appareils de perfectionnement surajoutés ; ce sont les derniers qui apparaissent dans le développement phylogénique, comme dans le développement ontogénique ; ce sont les plus complexes, les plus délicats, les plus fragiles de tous. Conséquemment, ce sont ceux que la maladie frappe les premiers. Eux détruits, la perception perd son appareil régulateur, et l'illusion des sens se transforme en *hallucination*.

#### IV.—THE PHILOSOPHY OF CHANCE.

By F. Y. EDGEWORTH.

THE first principles of the Calculus of Probabilities, the metaphysical roots rather than the mathematical branches of the science, are what I attempt here to examine.

Underlying the whole subject, but at a philosophical depth below the reach of the present inquiry, is the definition of probability. Probability may be described, agreeably to general usage, as importing partial incomplete belief. Whatever belief is—whether according to the doctrine of Hume, which has been much repeated but little improved, “belief is nothing but a more vivid, lively, forcible, firm, steady conception of an object than what the imagination alone is ever able to attain,” related to mere imagination as the “idea of an enchanted castle” to actual sensations; or whether, according to Professor Bain’s doctrine, belief is something more or something different, being of the nature of volition, “preparedness to act,”—whether these things are so or whether not, and whatever the physiological processes accompanying the phenomenon of consciousness, probability may be described, with sufficient accuracy for the present purpose, as differing somehow in degree from perfect belief or rather credibility. The Calculus of Probabilities is concerned with the estimation of degrees of probability; not every species of estimate, but that which is founded on a particular standard. That standard is the phenomenon of statistical uniformity: the fact that a genus can very frequently be subdivided into species such that the number of individuals in each species bears an approximately constant ratio to the number of individuals in the genus.<sup>1</sup> Thus the object of the calculus is probability as estimated by statistical uniformity: the partial belief about some unknown occurrence, as the throw of a die, *together with* the observed fact, or full belief, that any one face is thrown about as often as another. The foundation is regarded as an integral part of the whole structure; and indeed it is the most solid part. The indispensability of this objective foundation has been established by Mr. Venn;<sup>2</sup> with whom on this and all other

<sup>1</sup> Cf. Cournot *Théorie des Chances*, and Ellis, *Camb. Phil. Trans.*, viii.

<sup>2</sup> Cf. Ellis, *Camb. Phil. Trans.*, iii., and Mr. Venn’s more full exposition, *Logic of Chance*, ch. 3.



controverted points the present writer in the main agrees, while yet attempting to show that Mr. Venn's logical scepticism has often carried him too far from the position held by the majority of previous writers upon Chance. Thus he seems to go too far when he insists that quantity of belief is a "mere appendage" of the science. That Probability should be concerned only with certainty is surely a little paradoxical, and challenges inquiry.

Our first question then is: How far are gradations of belief a subject of science? Mr. Venn's negative criticism has great force; but it does not seem to hit, perhaps it was not aimed at, the moderate position here taken. Gradations of belief, it is submitted, can be discerned with some precision in simple cases, such as those which the mathematicians posit. Suppose there is an urn containing a hundred balls, black and white. The felt probability, the quantity of belief, that a white ball will be obtained at a single drawing continually increases, as we increase, other things being constant, the proportion of white to black balls. This measurement of a subjective feeling is like the measurement of felt heat by the thermometer. It is very like the Fechnerian measurements of sensation. Like the Fechnerian measurements it is directly applicable only to simple cases; and yet, as Fechner's law has some analogical bearing upon the higher problem of Hedonics, and seems to be the basis of the law of diminishing utility, so belief about the simple events of games of chance has fruitful analogy with belief about the more complicated events of real life. It must be frankly admitted, however, that the practical outcome of this subjective view is slight; that little can be worked by it which cannot be worked without it. There is only one class of practical problems to which the subjective view is exclusively applicable; those actions which cannot be regarded as forming part of a 'series' in Mr. Venn's sense; a class which with the increase of providence and sympathy is likely to disappear. The principal arguments adduced by Mr. Venn in his *Logic of Chance*, ch. 5, against 'gradations of belief' must now be passed in review.

(1) He doubts "that our belief of every proposition is a thing which we can be strictly said to measure". The answer is suggested by Mr. Venn when he supposes "that it were possible to strike a sort of average" of a fluctuating belief. Doubtless our feeling of quantity of belief is, even in the simpler cases, a somewhat vague presentation, like our feeling of quantity of time when, without having looked at the clock for some time, we try to think what o'clock it is.

In the more complicated beliefs not even this degree of precision is possible; however, even in such cases there may well be important quantitative, although not numerical, estimates.

(2) Mr. Venn next objects—"Should we find this average to be of the amount assigned by theory"? The answer is, as before, supplied by the doctrine of averages. The required conformity between our experienced feeling and the theoretic rule holds on an average. Mr. Venn tells us of the undue confidence of the gambler. But is there no such thing as undue diffidence? or may not the over-confidence of one party be balanced by that of another? Peter and Paul betting against each other about an event, the chance of which is really even, are each ready to give odds. Upon an average their opposite errors counterbalance each other.

(3) But, continues Mr. Venn, even supposing that quantification of belief is, and is according to standard scale, what security have we that it is as it ought to be? The instinctive is not always right. Resentment is an instinctive principle; yet it is right to subdue it. It may be replied that the comparison should be, not with resentment, but with those superior principles, as Butler calls them, rational self-love or benevolence, in virtue of which resentment is subdued. These principles, as Mill and others have observed, do not admit of proof in the ordinary sense. Somehow or other we make up our mind what canon of conduct to adopt. The first principle of belief is similarly self-balanced, and rests upon nothing. Accordingly, the position that belief *ought* not always to be what it is, or tends to be *normally*, if I may say so, finds its ethical analogue, not in the suppression of a secondary principle like resentment, but (as on the intellectual side we have to deal with no such hierarchy of principles) with that *self-limitation* of a supreme principle which has been so well illustrated by Butler and Mr. Sidgwick. And no doubt the self-limitation of belief in the interest of truth is conceivable, and has been defended. A certain degree of superstition is favourable to the imagination; a certain power of imagination is necessary to the perception of higher truth. Still this method of drugging the intellectual nature must be employed with great caution. Truth in the inward parts should be the rule; the "lie within the soul," the doubtful and dangerous exception.

(4) Again Mr. Venn objects that the selection of statistically measured belief, out of all other cases of belief, is arbitrary. The answer is that other important sciences are arbitrarily defined. Political economy is an arbitrarily selected

fragment of the Calculus of Hedonics ; an ill-defined tract of speculation irregularly grouped about a central spot, the theory of exchange, which is distinguished from the general phenomena of human life by the same attribute as the statistically measured belief, namely a certain quasi-mathematical precision.

(5) Whereas, it is said, full belief about an event is either verified or disproved by the event, fractional belief can only be justified or disproved by a series of events. There is a sort of Greek subtlety about this *ἀπορία*, by which I must confess myself baffled. I may observe, perhaps, that in cases of very high probability the correctness of the fraction may *very nearly* be disproved by even a single event ; that in order to verify the fraction there is perhaps required, not a whole series, but only as many terms as there are units in the denomination of the fraction. If the fraction is two-thirds, and if out of three trials the event occurs twice, may we say that the fraction is, not indeed proved, but in some sense verified ?

(6) It is finally objected that the phenomenon of a fraction being assigned to belief may be accounted for otherwise than on the supposition that the quantity of belief is measurable. The fraction is the measure of the quantity of advantage which Laplace calls *espérance*. Thus if  $p$  be the fraction which expresses the probability of an event, each occurrence of which brings me £1, and  $N$  the (large) number of trials to be made, then  $£pN$  is the value of my expectation. There is no doubt a large portion of truth in this explanation. Still it may be observed that, upon theories which are current that belief is of the nature of volition and that all volition is determined by the prospect of pleasure, the explanation propounded does not so much destroy as fulfil the theory that the fraction in question is the measure of quantity of belief. If belief cannot be identified with volition, then indeed those who dissent from Mr. Venn will have to postulate a sort of pre-established harmony between the distinct processes of volition and intellect. Yet this postulate cannot be regarded as very extravagant, considering the admitted interdependence of the different departments of mind, which, as Aristotle says of his *ἐνέργεια* and *ἡδὴν*, “seem to be joined together and not to admit of separation.” To resolve such distinctions exceeds the range of the present observer’s metaphysical microscope. I seem to see that gradations of belief are more capable of precision than some of Mr. Venn’s arguments admit. Yet I cannot refuse assent to his summing up. “The

different amounts of belief which we entertain upon different events, and which are recognised by various phrases in common use, have undoubtedly some meaning; but the greater part of their meaning, and certainly their only justification, are to be sought in the *series* of corresponding events to which they belong; in regard to which it may be shown that far more events are capable of being referred to a series than might be supposed at first sight." In short, the author commands approbation as a judge, though as an advocate he may be needlessly polemical; his conclusion seems correct, though his arguments prove too much.

So far we have been concerned with the simplest type of probability; the fact of a simple and perfect statistical uniformity, such as occurs in games of chance, together with the partial belief accompanying that known fact. We have looked at the outside, and we have endeavoured to peer into the inside, of the simple unit-cell, by the multiplication of which the science of pure probabilities is built up. If this were a mathematical treatise, it would be proper in the next place to consider those compound structures, ascending through the first seven principles of Laplace. But the complexities thus presented would be of a merely mathematical character; for, as Mr. Venn points out, inverse probability, *quâ* inverse, does not differ essentially from the simple species; a philosophical distinction arises, when the purity of the type above delineated becomes mixed with the imperfections of real existence. Suppose, for instance, the regularity of our die has not been fully established by actual experience; that we have only some reason to believe that it is not weighted, or only perhaps no reason to believe that it is weighted more upon one side than another. In contemplating this case let us endeavour to keep separate what may be called the outside view presented by the consideration of what Mr. Venn calls a 'series,' and the inside or subjective aspect of partial belief about the result of any particular throw.

The more objective view does not at first sight present any particular difficulty, any other difficulty than is presented by all applications of mathematical conceptions to real existence. In such applications there is ever, as Mill has well pointed out, some admixture of assumption and hypothesis. Even geometrical axioms must be taken *cum grano*. The fine remark of Burke, that the lines of morality are broad as well as long, is true also in some degree of physical lines. Constants ascertained only to a certain number of decimal places are employed. Nay, we must sometimes be

content with a mere guess as to the value of a constant; for instance, the *weight* to be assigned to an observation. Functions evaluated only to the third or fourth term of development are employed. Nay we may reason about functions without knowing even approximately their form. I have elsewhere attempted to illustrate this characteristic of mathematical reasoning,—superfluously indeed, for, as a reviewer observes, the person who supposes that the higher mathematics are but a complicated sort of double rule of three is not worth arguing with.

So far then as the imperfections of our reasonings are of the kind that is familiar in mathematical physics, no particular apology is required. Even Mr. Venn, while he points out the imperfection of our statistical data, yet allows a reasonable license in treating them as if they were perfect. Even that precisian, M. Block, for whom 'point de nombres point de statistique,' is obliged to admit a certain element of approximation. Nor is there any particular difficulty in extending the statistical method to unnumerical quantities, as Professor Jevons has pointed out.<sup>1</sup> There is no difficulty about handling those constants which, as Boole and Donkin point out, are generally introduced by problems in inverse probability; provided that we have some quantitative datum about the constant, as that it is not very great or not very small. This is admirably shown by Donkin in his profound essays on Probability in the *Philosophical Magazine*, 1850-1. Donkin puts the problem: A person who understands the game of chess sees a certain number of pieces placed in a particular situation. "What is to him the probability that the situation was actually produced by a game?" This inverse problem introduces the *à priori* probability that a game would be played, and other constants. If we know *something* about the ways of the house, we may know that this probability is not *very small*, and thus from the mathematical formula deduce a substantial though not a numerical conclusion. Similarly the much decried method of Bayes may be employed to deduce from the frequently experienced occurrence of a phenomenon the large probability of its recurrence. There is not required a precise *à priori* knowledge, as of variously constituted bags of balls, which Mr. Venn postulates (ch. 5). Almost any *à priori* knowledge, as Cournot<sup>2</sup> has well shown, is sufficient to deduce an overwhelmingly large,

<sup>1</sup> *Report of the British Association*, 1870.

<sup>2</sup> *Théorie des Chances*, § 95, p. 169.

though not of course a numerically-measured, probability. And similarly in applying the Calculus of Probabilities, as the most distinguished astronomers have done, to the question whether the distribution of the fixed stars can be regarded as the result of a random sprinkling, do we not know *something* about the involved constant, the *à priori* probability that such a chance-distribution should have taken place? Have we not experienced that chance does not certainly rule among the celestial phenomena, that the constants expressing *à priori* probability are not equal to unity, in the case of similar arguments which have been confirmed by fact, for instance, the argument which the Calculus of Probabilities has drawn from the apparent motion of all the fixed stars round the earth in favour of the earth's revolution, and other examples adduced by Professor Jevons in the *Principles of Science*?

Or, in leaving terrestrial phenomena, are we leaving the solid ground of experience? In treating celestial constants as equally likely to have one value as another, are we entering on a region peculiar to probability and not governed by the general analogy of mathematical physics? As long as we have some approximate data, that hypothetical reasoning should be based upon imperfect data is agreeable to the experience of mathematical physics. But what is peculiar and paradoxical in probabilities is that our reasoning appears to become more accurate as our ignorance becomes complete; that when we have embarked upon chaos we seem to drop down into a cosmos. Just when probability, founded upon statistical fact, material probability, as Boole calls it,<sup>1</sup> has reached the utmost degree of tenuity, we fall back upon intellectual probability. Such a turning-point we seem now to have reached in the progress of our illustrations from the more to the less accurate data.

I submit that the 'intellectual' probability is not essentially different from the 'material,' but only consists, so to speak, of a more diffused sort of matter; that the change which is made is not from experience into dreamland, but from a particular to a more general sort of experience. The case is paralleled, perhaps, and explained by a familiar and all-pervading arithmetical experience. Suppose we are evaluating a decimal. If we know nothing at all about the forthcoming 'place' or digit, then one digit is as likely to occur as another. The ground of this belief is a very wide experience, perhaps, of the unconscious and even ante-natal species,

<sup>1</sup> *Edinb. Roy. Soc. Proc.*, xx.

which some prefer to call intuitive knowledge. At any rate the belief is supported by actual experience, the rough experience of anyone who has ever worked sums in arithmetic, the precise experience of Mr. Proctor, who actually counted the digits occurring in the pages of a logarithm table. This *à priori* knowledge about the forthcoming digit is perfectly real and substantial; yet it does not count for much when weighed against special knowledge that the digit in question is in a certain neighbourhood. Suppose, for instance, that a constant is being evaluated, and that special knowledge about a forthcoming place is afforded by actual observation: for instance, that '6 has been very often observed, '7 and '5 not so often, and the rest very rarely. It would be quite correct, I think, according to the method of Bayes, to treat the *à priori* probability of each digit as 1-10th, the *à posteriori* probability of say 0 or 9 as indefinitely small. Similarly, I submit, the assumption that any probability-constant about which we know nothing in particular is as likely to have one value as another is grounded upon the rough but solid experience that such constants do, as a matter of fact, as often have one value as another. And accordingly such constants afford a basis for that inverse method which is so beautifully illustrated by Donkin in the article referred to.

The ridicule which has been heaped upon Bayes's theorem and the inverse method will be found only applicable to the pretence, here deprecated, of eliciting knowledge out of ignorance, something out of nothing. The most formidable objection is that which was made by Boole, and is repeated by Mr. Venn,<sup>1</sup> Mr. Peirce,<sup>2</sup> and others with approbation. Our procedure in treating one value as *à priori* not less likely than another is, it is said, of a quite arbitrary character, and apt to lead to different conclusions from the plausible one which we have reached by accident. I will not transcribe the argument of Boole,<sup>3</sup> but will attempt to parody it. Suppose we are considering the probable value of a forthcoming decimal place in the evaluation of some constant. Now this *à priori* probability may be considered as thus given. Suppose there are ten urns, A, B, . . . J. A constitution of the system consists in a particular combination of the emptiness of some urns with the fulness of others, e.g., ABCDEFGHIJ is a particular constitution, where the superposed negative sign denotes emptiness. Now the forthcoming digit corresponds to the number of full urns

<sup>1</sup> *Logic of Chance*, ch. 6, § 13.

<sup>2</sup> *Studies in Logic*.

<sup>3</sup> *Laws of Thought*, 370.



(whatever their letters) in the above example, 7. The chance of an urn being full or empty is even. Therefore we see by reasoning familiar to students of the *Law of Errors*, that the chance of 9 or 0 is very small; and if the number of the urns were infinite, would be infinitesimal; which is absurd. The answer of course is, that you have no right to frame an hypothesis which is at variance with the experienced fact that one digit does turn up as often as another. "It is making a very unexpected tour," as Hume says of the vagaries of hypothesis, from a supposition erected upon facts to reason down to the negation of the facts. But we do not want to leave the facts at all. We take our stand upon the fact that probability-constants occurring in nature present every variety of fractional value; and that natural constants in general are found to show no preference for one number rather than another. Acting upon which supposition, while in particular cases we shall err, in the long run we shall find our account.

The view here propounded, that the so-called intellectual probability is not essentially different from the probability which is founded upon special statistics, must now be tested by a few examples.

(1) The most important instance is that afforded by the Art of Measurement, which postulates that the *a priori* probability of one value being correct is as great as that of another; that, as a matter of fact, measurables do in general as often have one value as another. Take the simplest case, that of an instrument of which the errors are known to arrange themselves according to a certain *law of error*. Given a set of observations, we have to calculate from what point (or value) as centre the given observations are most likely to have diverged. The calculation presupposes that the *a priori* probability of one value is the same as that of another. That essential fact underlies both the common-sense practice of taking an average, and the most refined methods of the Theory of Observations.

(2) Let us take next an example put by Mill. It is known that a box or urn contains a hundred balls of two different colours, white and black, ninety-nine of one colour, and one of the other; but which colour is in the majority is absolutely unknown. The probability of drawing a white ball is  $\frac{1}{2}$ . I believe that the numerical value is justified by the fact that in a great number of experiences with urns one colour would as often be in the majority as another. And this, whatever the origin of our doubt as to the constitution of the urns; whether we knew that the urn before us was

the result of a random selection, or whether we, or our informant, had once known, but completely forgotten, which was the preponderating colour. For in the latter case the constitution of our urn falls into the category of things which are experienced to happen just as often one way as another. As Ellis says,<sup>1</sup> "When we expect two events equally, we believe that they will recur equally in the long run".

This position appears to be intermediate between that of Mill<sup>2</sup> and Mr. Venn; agreeing with Mr. Venn that for the significant employment of the Calculus of Probabilities, objective data are requisite; but disagreeing from Mr. Venn's assertion that in most cases of inverse probability such data are not forthcoming.

(3) The following is given by Boole<sup>3</sup> as the typical instance of 'intellectual' probability. The material probability of one event is  $x$ , of another is  $y$ . Of their concurrence nothing is known experientially. Then the intellectual probability of the double event is  $xy$ ; though of course, as a matter of fact, the statistical frequency of the double event may turn out to be different. In so far as the assigned value,  $xy$ , has any real value, I think it must be grounded on the experience that, in the long run, consisting of events in general occurrence, events are found to be independent of one another; or that the connexions between events tending to increase the probability of the double event above  $xy$  are just balanced by the repugnancies tending to depress the true value below  $xy$ . Referring to our typical instance of arithmetical experience, let us consider the probability of two forthcoming decimal places (about which nothing is known) being, say, 73. In virtue of the general experience that these different figures of natural constants have no discernible connexion distinguishing them on inspection from a chance aggregation of digits, it would be safe to say, I think, that the *à priori* probability of 73 is 1-100th; and I shall be prepared to find that about one in a hundred logarithms had, say, its sixth and seventh places respectively 7 and 3. And, if we take into account the second consideration above specified as a ground for the value of  $xy$ , it would not, I think, affect the value as long as we range over the wider experiences, such as that of number; though no doubt there may be particular departments of phenomena which may be com-

<sup>1</sup> *Camb. Phil. Trans.*, viii.

<sup>2</sup> *Logic*, bk. iii., ch. 18, § 1.

<sup>3</sup> *Edinburgh Roy. Soc. Proc.*

pared to persons whose appearances on any scene may be regarded as in general independent, but who, in so far as they do influence each other's movements, exercise only an attractive influence.  $x$  and  $y$  then being the respective statistical probability of appearance for two persons, the probability of their meeting would not be  $xy$ , but rather  $xy + c$ .

(4) The preceding instance belongs to, and may fitly introduce Boole's method of probabilities, the peculiar feature of which is that it deals with probabilities which are not determined by statistics. What is to be said of these mysteriously evolved probabilities? I do not feel able to say with Jevons that they are the most probable probabilities consistent with the data. I only see that they are consistent with the data, and that there is some analogy, I know not of what weight, between the method of attaining these values by the logical calculus and the procedure in the simple case just considered of  $xy$ , which does seem to rest upon actual experience. I should not be surprised if others more quick-sighted were able to intuit the connexion of the Boolean solutions with actual experience; to ground them "upon reasonableness of hypothesis viewed in the light of that general analogy of nature which experience tends daily to confirm" (Donkin).

At any rate the values in question are possible values consistent with the data, as Boole has shown by a most remarkable mathematical investigation,<sup>1</sup> which certainly seems to remove his calculus from the sphere of mere guess-work. Accordingly the Boolean calculus may subserve what is probably the principal use of 'intellectual' probabilities: namely, to afford an hypothesis which may serve as a starting point for further observation. This is a use more important than the only rôle which Cournot will allow to subjective probability, as he calls it: namely, to regulate the conditions of a bet.

At the risk of appearing visionary, I will suggest another possible rôle. I have elsewhere argued that, as the *régime* of contract becomes predominant, there will arise a wide-spread need for a principle of adjustment between self-interested contractors, whether in commerce or in politics;<sup>2</sup> and that the required basis can be no other than the utility of all concerned. Well, then, in the absence of definite calculations of utility, it may be found necessary often to fall back upon those analogies confirmed by general experience which con-

<sup>1</sup> *Transactions of the Royal Society*, 1862.

<sup>2</sup> *Mathematical Psychics*, p. 55.

stitute intellectual probability. And in fact something of this sort appears to be unconsciously performed by the utilitarian who thinks it 'fair' to treat as equals those between whom no material difference is discerned. As Jevons says, with direct reference to the external world, but with that deep undertone of harmony with the things of soul which pervades his chapters upon Probability and Measurement, we must treat as equals things which are not known to be unequal.

The preceding examples, especially the first, may show that the assumptions connected with 'Inverse Probability,' far from being arbitrary, constitute a very good working hypothesis. They suggest that the particular species of inverse probability called the 'Rule of Succession' may not be so inane as Mr. Venn would have us believe. Admitting that the metaphor of nature's urn<sup>1</sup> does not much aid us in the work of Induction, may we not still say with Sir John Herschel, "It is never without its instruction to trace this sort of parallel between mental impressions and abstract numerical relations"?<sup>2</sup> Consider a chemical law which may be established by two or three careful experiments. To say that our certitude is here measured by 3-4ths or 4-5ths would be absurd. But the ground of our belief is not simply the two or three occurrences. There is the substratum established by a wide experience, that what has held good in two or three such chemical experiments will hold good generally. The case is not like drawing balls out of a jar about the constitution of which we know nothing but that one constitution is as likely as another; but rather like drawing a little jar out of a big jar, the constitution of which big jar is such that the contained jars contain each balls of one colour. When, then, we have ascertained the colour of any little jar, we know that all the future drawings from that jar will present the same colour. But how did we ascertain the character of the big jar's contents? By a simple induction to which the idea of sortition may not be irrelevant. The fact that upon so many trials there occurred no instance contradicting the generalisation in question does seem analogous to the continual drawing of balls of the same colour from an urn of whose contents before the drawing we were completely ignorant. The mathematical conceptions of the Rule of Succession do appear applicable to the inductions of simple enumeration; in particular to those *axiomata media*,

<sup>1</sup> Cf. Jevons's *Principles of Science*, ch. 11, end.

<sup>2</sup> "On an Application of the Rule of Succession," *Edinburgh Review*, 1850.

as they may be called, with reference to the law of causation on the one hand and particular laws on the other—such as the constancy of chemical laws, the constancy of anatomical forms, the inconstancy of certain psychical phenomena—which contribute important, though unnoticed,<sup>1</sup> foundations to the fabric of inductive logic. I would not undertake to indicate the exact points at which the sustaining forces are applied to that substructure, which, in Mr. Venn's words, "is not so much to be compared to the solid foundations of an ordinary building as to the piles of the houses of Rotterdam, which rest somehow in a deep bed of soft mud". I only submit that the Rule of Succession may constitute, if not one of the piles, at least an important cross-beam, in that mysterious structure.

Having now found that indeterminate probabilities, considered as statements of statistical fact, are respectably grounded upon experience, let us look at the subjective side which, on entering this department of the science, we agreed to postpone. Let us examine the paradox that there should be an accurate measure of 'quantity of belief'—as claimed by some for the constants of inverse probability in the absence of accurate statistics. The paradox disappears in our view that the precise quantity of belief does rest upon precise experience, such as that one digit occurs as often as another in nature. Where this conception of an exact, however general, experience is inappropriate, there the precise measurement of quantity of belief is impossible. The consideration of quantity of belief does not present any peculiar difficulty in the case of imperfect statistics—any difficulty essentially different from those which we have already discussed, with special reference to the case of perfectly determinate statistical data. The relation between the fact of statistics and the feeling of belief is not much more obscure because the things related are not precisely measurable.

So far as to the pure science of Probabilities. I have elsewhere<sup>2</sup> attempted to treat of the mixed science of Probability and Utility: of what Laplace calls *espérance*, the product of probability upon utility; that quantity which to maximise is the main problem of the Art of Measurement—of the art proper, which is described by its founder as the most *advantageous* method of combining observations, and of *μετρητικῇ* in a wider sense.

<sup>1</sup> There are some excellent remarks on the concatenation of our different beliefs in Cournot, *Théorie des Chances*, p. 229.

<sup>2</sup> *Philosophical Magazine*, for November, 1883, and February, 1884.

## V.—GIORDANO BRUNO.

By THOMAS WHITTAKER.

THE interest excited by the personality of Giordano Bruno must always have prevented his name from being quite forgotten. But for two centuries after his death his writings were very little known. It was not until 1830 that the Italian works were collected, and no complete edition of the Latin works exists even now. Within the present century, however, not only have the events of Bruno's life formed the subject of more than one investigation, but his philosophy also has attracted new attention. This renewed interest in Bruno may perhaps be ascribed to the historical spirit of the age. But the study of his works, besides confirming the impression which his intellectual power and philosophical genius produced at first throughout Europe, and which has perpetuated itself in the history of philosophy, will in the end make it clear that his ideas have still a direct bearing on thought.

The investigations that have been mentioned above have added much to our knowledge of the life of Bruno. The materials for his biography were till lately, besides the letter of Scioppius written from Rome on the 17th of February 1600 (the day when Bruno was burnt in the Campo di Fiora), chiefly the occasional references to events of his life that are to be found in his works. All that could be known at the time was embodied by Bartholmæss in the first volume of his monograph on Bruno, published in 1846. Since then, documents have been discovered at Venice, containing the records of his examination by the Inquisition there, and have been published along with a new biography by Prof. Berti (1868). The same writer has published more recently (1880) copies with which he had been furnished of the Protocols of the Inquisition at Rome relating to the last year of Bruno's imprisonment. These were obtained by a research in the archives of the Vatican which the Roman revolution of 1848 made it possible to begin but not to finish. The principal facts that have been established by these and other documents are given by Prof. Sigwart in an essay included in his *Kleine Schriften* (1881).

The exact year of Bruno's birth was fixed for the first time by the Venetian documents. He was born in 1548 at

Nola in the kingdom of Naples, then under Spanish rule. His baptismal name was Filippo. The name of Giordano was assumed by him when he became a monk of the Dominican order at Naples. His noviciate began in 1562 or 1563. He received full orders in 1572. In 1576 he ceased to wear the Dominican habit. He had already been accused of heresy during his noviciate. He was now charged with holding heretical views on the Trinity. To avoid this charge he fled to Rome. At Rome the charge against him was to have been proceeded with; but he was informed of this, and escaped to Genoa. After residing for a short time in various cities of the north, he at length decided to leave Italy. He went first to Geneva, where there were many Italian exiles; but finding that to live there it would be necessary for him to profess Calvinism, he left Geneva after a residence of about two months. In 1577 or 1578 began his two years' residence at Toulouse. At the University of Toulouse he obtained the degree of doctor, and was appointed to an ordinary professorship of philosophy. In 1579 or 1580 he left Toulouse for Paris. There he published several Latin works, including the *De Umbris Idearum*, besides an Italian comedy, *Il Candelaiio*. He refused an ordinary professorship which was offered him at the University of Paris, because in order to hold it he would have had to attend mass. An extraordinary professorship not having this obligation attached to it was conferred on him by Henry III., to whom he had dedicated the *De Umbris Idearum*. Towards the end of 1583 he set out from France with letters from Henry to his ambassador at the court of Queen Elizabeth, Michel de Castelnau, who received him into his house. In London he frequented the society of Sir Philip Sidney, Fulke Greville and other distinguished men. He lectured and held disputations at Oxford. During his residence in England he published the most important of his works, the Italian dialogues; of these the *Cena delle Ceneri*, *Della Causa* and *Dell' Infinito* are dedicated to Castelnau, the *Spaccio della Bestia trionfante* and the *Eroici Furori* to Sidney. In 1585 he returned to Paris, where he drew up theses against the Aristotelian physics, which were afterwards published at Wittenberg. These theses were defended by a disciple of his named Hennequin in a public disputation held on the 25th of May, 1586. Soon after this he left France for Germany. From August 1586 to May 1588 he resided at Wittenberg, lecturing at the University and teaching privately. In his valedictory address to the University he praised the tolerance that was practised there and



the courteous manner in which he had been treated. The next place he visited was Prague. In return for the dedication of one of his books he received a subsidy from the Emperor Rudolf II., afterwards the patron of Kepler. From Prague he went to Helmstädt. He composed there the three philosophical poems, *De triplici Minimo et Mensura*, *De Monade, Numero et Figura*, and *De Immenso et Innumerabilibus*, and dedicated them to Henry Julius, Duke of Brunswick. In order to get these books printed he went to Frankfort, where he remained from June 1590 to February 1591. At Frankfort he received letters from a young Venetian noble named Giovanni Mocenigo, asking him to visit him at his house in Venice and instruct him in the art of memory set forth in the *De Umbris Idearum* and other books devoted to the *Ars magna* of Raymond Lully. This was the cause of Bruno's return to Italy. Before his return he spent an interval at Zürich, during which he dictated his *Summa Terminorum metaphysicorum*, first printed, with a preface by Raphael Eglinus, in 1595. After his arrival in Italy in September or October 1591, he lived alternately at Venice and at Padua. In March 1592, he began to reside permanently in the house of Mocenigo. Two months later Mocenigo, constrained "by obligation of conscience and by order of his confessor," denounced him to the Inquisition as a teacher of impious doctrines. He was arrested and brought before the tribunal of the Inquisition at Venice. After his examination it was decided by the Grand Inquisitor San Severina, on the report of the tribunal, that he must be sent to Rome to be judged. The Venetian government was at first unwilling to grant his extradition, but at length yielded; and at the beginning of 1593 he was taken to Rome, where he remained in the prisons of the Inquisition till 1600. Nothing is known of the first six years of this imprisonment. But it is now known from the documents found in the Vatican that early in 1599, at a session of the Congregation held under the presidency of the Pope (Clement VIII.), it was decided that Bruno should be required to abjure eight heretical propositions selected from his writings and from the statements that had been submitted to the Inquisitors. Only one answer of Bruno's is recorded, and this is a declaration that he has seen no reason to change his opinions. On the 9th of February, 1600, he was condemned and delivered over to the secular power, with the usual request, "*ut quam clementissime et citra sanguinis effusionem puniretur*". When the sentence was read to him he answered, as Scioppius says, "threateningly"—"*Majori forsan cum timore sen-*

*tentiam in me fertis quam ego accipiam* ". Eight days later he was burnt in the presence of a multitude of people who were assembled in Rome for the Jubilee.

More than one passage might be quoted from Bruno's works showing that he had anticipated for himself some such fate as this. When he was interrogated by the Venetian tribunal he admitted that his doctrines were indirectly opposed to the faith. His defence was that he was not an innovator in religion but in philosophy. He declared that he had never attached himself to any heretical sect ; that, on the contrary, he preferred the religion of the Catholics to that of the Lutherans and Calvinists, because it laid more stress on good works ; and that he was willing to submit to the Church in matters of theology. This last position was, as Berti says, a traditional position adopted by Bruno from the philosophers of the Middle Ages, who had tried to obtain toleration by means of it. In several passages of his works, and not merely in his answers to the Inquisitors, he says that in matters of faith he submits to the theologians. Sometimes this submission is merely ironical ; it is in part, as has been said, the traditional means of defence of philosophers against persecution ; but it is also expressive of Bruno's philosophy of religion, as will be seen. If it had been possible for Catholicism to grant philosophical freedom, he would have regarded it almost as the philosophers of antiquity regarded the religion of the State. It was philosophical freedom that he claimed, not freedom to found a new religious sect. But philosophical freedom was the kind of freedom that was least of all likely to be conceded by the Catholic reaction. Only an unqualified submission would have satisfied the Church, and this Bruno was incapable of making.

A few months before Bruno's extradition by the Venetian government, Galileo had begun to lecture at Padua. As is well known, Bruno accepted the Copernican astronomy as the basis of his cosmology before Galileo had made his discoveries with the telescope. Kepler, who lived in Prague fifteen years later than Bruno and was acquainted with some of his works, expressed admiration for him and regret that Galileo had not made some reference to his predecessor in the advocacy of the new astronomical doctrines. The fact that Bruno has a place in the history of astronomy as well as in the history of philosophy is expressive of the change that was taking place in the chief direction of the enthusiasm of discovery that characterised the Renaissance in Italy. This enthusiasm had been in great part trans-

ferred from the remains of classical antiquity to physical science. The representatives of classical learning were now frequently pedants of the type satirised by Bruno in his comedy *Il Candelaio*. The latter part of the sixteenth century was a period of literary decadence in Italy, not, as in England and France, a period of literary creation. But in England and France the scientific movement had scarcely begun. After he had seen the chief countries of Europe and their universities, Bruno expressed most admiration for the spirit of free intellectual activity that was already making itself felt in the universities of Germany. He praised Luther as the liberator of the human intellect, as a new Alcides greater than the first in that with the pen instead of the club he had subdued a more dangerous and more powerful Cerberus. He seems to have thought that pre-eminence in science as well as in learning had passed for a time from Italy to Germany.

But science and learning were regarded by Bruno as a means to an end. He has drawn the distinction between knowledge that is "instrumental" or "organic" and that which by itself leads to the perfection of the mind.<sup>1</sup> One reason why he so often attacked "the grammarians" was that they were the great representatives in his time of the pursuit of instrumental knowledge as an end in itself. They were at the same time the most prominent among the official defenders of the authority of Aristotle and of received opinions generally, and thus there was another ground of his hostility. But he saw that others besides the humanists might give themselves up to "laborious idleness". He ridiculed some of the researches of mathematicians, physicists and scholastic philosophers no less than those of the grammarians. And he admitted that the minute studies of the grammarians as well as those of logicians, physicists and mathematicians have a certain utility in providing exercises for those who will afterwards go on to the true end of study.

Notwithstanding the admiration which he so often expresses for Copernicus, Bruno was of opinion that he had had too much regard for "mathematical" and too little for "physical" considerations, that he had had in view facility of calculation rather than the nature of things. In his reformed astronomy Copernicus had retained the eighth sphere of the Ptolemaic system, the sphere which was supposed to carry round the fixed stars by its revolution. Bruno abolished the whole system of spheres and substituted for it the idea

<sup>1</sup> *Summa Terminorum metaphysicorum*, ed. Gfrörer, p. 440.

of an infinite space in which there are innumerable systems like the solar system, having the so-called fixed stars for their centres. But he still thought Copernicus inferior to no astronomer who had been before him. He saw in him the thinker who had set himself free from the opinions of the multitude, and had first made possible the more complete emancipation of the intellect that is the consequence of the substitution of the conception of an infinite for that of a finite universe. This new philosophical conception seemed to him to bring with it far greater good than the discovery of new continents. Those who have discovered new continents, he says, have found out the way to disturb the peace of nations, to multiply vices, to propagate tyrannies, while the new philosophy, on the other hand, liberates the mind from chimeras and shows it how to ascend to the stars.

Though Bruno satirised the humanists, he had himself much classical learning. His biographers have remarked the evidences of extensive reading that are to be found in his works. He had studied with special interest the records of the teachings of the pre-Socratic philosophers. He was of opinion that Pythagoras and other early speculators had had a truer view of the universe than that which had triumphed through the authority of Aristotle. He claimed to have revived this earlier and truer philosophy, of which the fragments had first been gathered together by Copernicus, although, for the reason that has been mentioned, Copernicus had not been able completely to convict "the vulgar philosophy" of falsehood.

Another branch of learning to which Bruno had given special attention was the study of mythology; not only the mythology of the Greeks but also that of the Egyptians and of the ancient nations of the East so far as knowledge of it was accessible to him. He had, as Bartholmæss points out, the idea of a science of comparative mythology.

The polemic of Bruno against Aristotle is chiefly directed against his cosmology. He acknowledges his pre-eminence in rhetoric, in politics, in logic, and often quotes his opinions with approval even in physics and in metaphysics; but he accuses him of misrepresenting the opinions of the earlier philosophers who were superior to him. At the same time, in opposing the established cosmological system, he brings against those who appeal to authority the argument that the moderns are really older than the ancients. He preferred Plato to Aristotle, and it is evident that he had been influenced by the Platonists of his own and the preceding age as well as by the Alexandrian Neo-Platonists. Yet he often

opposes the Platonic doctrines no less than those of the official Peripatetic philosophy.

A more directly metaphysical impulse was received by Bruno from Nicholas of Cusa than from any other modern thinker. Cusa has been described as the first German who, in the fifteenth century, attached himself to the study of Grecian antiquity. He was known as a reformer within the limits of Catholicism, took part in the Council of Basel, and was made a Cardinal. There are said to be suggestions of some of the new astronomical doctrines in his chief work, *De docta Ignorantia*. The most important idea that Bruno derived from him was that of "the coincidence of contraries". He thought that "the divine Cusanus," as he sometimes calls him, would have been still greater as a philosopher if he had not been restricted through his position in the Church; for Cusa had tried to reconcile his philosophical system with the dogmas of Catholicism.

Bruno ascribed some of the ideas of the Cardinal of Cusa to the influence of Raymond Lully (1235-1315), famous in tradition as an alchemist. Lully was the author of a system of logic by which the Mohammedans were to be converted to Christianity. His disciples maintained that his logical system was a means of discovering all truth. It is worthy of remark that he had not subordinated philosophy to theology; the doctrines of Catholic theology were to emerge as the result of a logical process. Bruno made additions to Lully's system, and during the whole period of his philosophical activity spent much time in writing expositions of it and in teaching it both publicly and privately. That which attracted him in it was probably the conception of the unity of knowledge, expressed in the doctrine that the mind may pass from any one idea to any other idea. But no relation except this very general one can be traced between the logical and mnemonic art of Lully and Bruno's own philosophical doctrines.

If the exposition of the mnemonic art in the *De Umbris Idearum* may be taken as an example, Bruno's treatment of the details of the system founded by him on that of Lully is very obscure. Other passages in his Latin works are affected with an obscurity similar to that of the "Lullian jargon". But this occasional obscurity does not affect the essential character of Bruno's writings. As in the *De Umbris Idearum*, the passages that are of philosophical interest are always perfectly clear. And in the obscure passages themselves there is nothing of the nature of imperfect articulation. It is difficult to believe that they were intended to be understood.

They are, as Berti calls them, "sibylline and unintelligible"; and as he goes on to say, they do not seem to be of any importance so far as their meaning can be conjectured.

The Italian works are free from passages of this kind, and on the whole they are of more interest and importance than the Latin works. The exposition is, besides, more systematic in the chief Italian dialogues than in the Latin poems on the same subjects. But there are many passages in the Latin works that are scarcely inferior to anything in the Italian works, and an account of Bruno's philosophy would be incomplete without reference to them.

Bruno's mode of exposition, both in the Latin and in the Italian works, is literary rather than scientific. He did not, indeed, make any attempt at that elegance of Latin style which was the chief object of the "Ciceronians". And in writing Italian, he thought it absurd to reject a word merely because it had not been used by any classical Italian author. But, on the other hand, he did not make for himself a rigid terminology. He says in the introduction to the earliest of his works that he does not refuse to make use of the terminology of any school, if only it is that by which he can best convey his idea;<sup>1</sup> and in his latest work he protests against the rigid method of interpreting philosophical terms practised by the "Grammarians".<sup>2</sup> Again, he uses quite freely, in order to convey his metaphysical ideas in an imaginative form, both the poetical and the philosophical conceptions he has met with in his reading. He takes pleasure in paradoxes, in ingenious combinations of ideas, so far as they help to bring out more clearly his own thought. He does not, like some philosophers, attempt to construct a system of which every detail shall be expressive of a conclusion that is logically connected with all the rest. But his essential ideas are none the less clear for this. And the vivid colouring that is given to his expositions by the use of illustrations from all sources only makes more evident the originality of his philosophy as a whole.

Bruno's essential originality is in philosophy in the strict sense of the term. He had, however, as has been seen, given special attention to the study of physical science. Some of the scientific speculations that are met with incidentally in his works are interesting as anticipations of modern ideas. He would probably not have laid much stress on them as parts of his contribution to thought; for

<sup>1</sup> *De Umbris Idearum*, ed. Tugini, pp. 20-3.

<sup>2</sup> *Summa Terminorum metaphysicorum*, Gfrörer, p. 455.

just as learning was to him material for the expression of his metaphysical ideas, so science was a means of arriving at a true conception of nature as a whole. But in order to illustrate his mode of thought in dealing with special scientific questions, his theory of the causes of the present distribution of life on the earth may be referred to.

He holds that the earth, under the influence of the light and heat of the sun, has the power of producing all forms of life from any part of itself, provided that the proper kinds of matter are present there. It is not necessary, he says, to suppose that all men are descended from the same ancestor; nor is each of the other races of animals descended from a common ancestor; all kinds of animals were produced in all parts of the earth. But in different places different kinds of animals have been destroyed and different kinds have remained; as in England, for example, certain kinds of wild animals have been destroyed through the cultivation of the country by men, and in other islands all men have perished through the predominance of the more powerful animals or through lack of food.<sup>1</sup>

The mode of thinking that has since given origin to the theory of natural selection is obviously expressing itself here under the limitations imposed by the state of the sciences of life in the sixteenth century. Bruno has speculated in the same spirit on the reason of the distances maintained by the different planetary systems from one another.<sup>2</sup> He has himself indicated the relation of this speculation to the ancient speculations as to the survival of certain combinations of atoms. He had a great admiration for Lucretius and imitated him in his later Latin works. He sometimes speaks of atoms as the "first bodies," the only solid parts of the world.

Atomic speculations, however, are subordinate in Bruno's philosophy. He himself, in the passage just referred to and in other places, distinguishes his doctrine from that of Democritus. He points out that while Democritus regarded life and mind as accidental products of certain combinations of atoms, he on the contrary regards them as equally eternal with atoms. He often quotes the following lines from Virgil as an expression of the doctrine he opposes to that of the Epicurean school:—

Principio coelum ac terras composque liquentes,  
Lucentemque globum lunae, Titaniaque astra,  
Spiritus intus alit, totamque infusa per artus  
Mens agitat molem, et magno se corpore miscet.

<sup>1</sup> *De Immenso*, vii., c. 18.

<sup>2</sup> *De Immenso*, v., c. 3.



This doctrine is the philosophical basis of the theory of the origin of life described above. The power of the earth to produce all forms of life from all parts of itself is inferred from the presence of the soul of the world in the whole and in every part.

In Bruno's system God,—the absolute intellect,—is at once the beginning of things and the end to which they aspire according to the degree of their perfection. The divine intellect manifested in nature is "the soul of the world"; in the human mind it expresses itself as the desire to comprehend all things in relation to the unity from which they proceed. All particular things, so far as they are outside the divine intellect, are in truth vanity, nothingness; they have being only so far as they participate in the being of God.

It has been disputed whether Bruno's doctrine is theistic or pantheistic. Carrière, in his book on the philosophers of the Reformation, takes the view that there is a transition in Bruno's writings from pantheism to theism; that the Italian dialogues are more pantheistic, the later Latin works more theistic. E. B. Hartung, in an exposition of Bruno's ethical ideas and of their relation to his metaphysics, admits to a certain extent the truth of this view; but he points out that Bruno's definitions exclude the ideas of the personality of God and of his separateness from the world; since these ideas must be regarded as essential to theism, he concludes that Bruno's doctrine is, strictly speaking, pantheistic. Now both these ideas are just as much excluded from Bruno's later as from his earlier works. It might even be maintained that some definitions in the later works are more distinctly pantheistic than those of the earlier works.

The ground of Carrière's view seems to be this. In the dialogues *Della Causa* and *Dell' Infinito* the unity in which all things have their origin is described as manifesting itself in nature. The other aspect of this unity, its aspect as an end which the human intellect seeks to attain, is indicated and is placed in relation with the first. It is said, for example, in *Della Causa* that the process by which nature descends to the production of things and the process by which the intellect ascends to the knowledge of them are one and the same, that both the intellect and nature proceed from unity to unity through multiplicity. But this other side of Bruno's doctrine is more obvious in the later Latin works than in these particular dialogues. These dialogues, therefore, appear more "pantheistic," in one sense of the term, and the Latin poems more "theistic". But the view that has been

supposed to be characteristic of the earlier works is found in the later works also. Here, for example, is an expression of it from the *Summa Terminorum metaphysicorum*—"Natura aut est Deus ipse, aut divina virtus in rebus ipsis manifestata". It is alluded to in the poem *De Immenso* as a doctrine that has constantly been held by the author. And the dialogues *Degli eroici Furori*, which belong to the London and not to the Frankfort period, are devoted chiefly to the expression of the other side of Bruno's doctrine. In these dialogues the aspiration of the mind towards absolute unity is described. It is said that the contemplation of this unity is what the Peripatetics have in view when they say that the highest happiness of man consists in perfection by the speculative sciences. The opinion of Plotinus is quoted with approval to the effect that "the mind" (as distinguished from "the soul") "either is God or is in God". Thus the contrast between the earlier and the later works again disappears. The explanation of its having been supposed to exist is probably that the poems of the Frankfort period, because of the resemblance of their subject-matter to that of the two best-known Italian works, have been compared with these to the exclusion of the others. When they are compared with the Italian works generally, it is seen that the less systematic mode of exposition adopted in them has made it possible to include elements that do not receive full expression in *Della Causa* and *Dell' Infinito*, but which are more completely expressed in the *Eroici Furori* than anywhere else in Bruno's writings.

The two sides of Bruno's doctrine are brought into relation by means of the idea of perpetual transformation, of a descent of beings from unity on the one hand and an ascent towards it on the other. This idea is already present in the first of his philosophical works, *De Umbris Idearum* (1582). In this book, indeed, most of his characteristic ideas are put forward quite distinctly though without the development which they afterwards received.

The influence of Platonism is evident in the title—"Of the Shadows of Ideas". But Bruno distinguishes his own doctrine of transformation from the doctrine of emanation taught by the Neo-Platonists. He holds that as there is a continual passage from light to darkness by which the higher beings become lower, so also there is a continual passage in the opposite direction by which the lowest beings may gradually return to the highest state. Light is here the symbol of the region of ideas, of the absolute unity which alone truly exists. Darkness is merely the negation of light ;

it is the symbol of non-existence. The "Shadows of Ideas" are things in nature and thoughts in the mind. They partake of the nature of light and of darkness. Any natural thing can change its form and (within certain limits), assume any other form. Similarly the intellect can pass from any particular thought to any other thought, if it has thoughts that can serve as means between the extremes. The end that the intellect ought to propose to itself is ascent to the region of Ideas, to the knowledge of the One as distinguished from the Many, of the permanent as distinguished from forms that change. The vision of the absolute unity must be described as a state, not as a process. Since the human mind is continually disturbed by sense and imagination, this state cannot last long, and is therefore spoken of in the past rather than in the present tense.

There is a very interesting passage in the *De Umbris Idearum* on the relation of Art to Nature.<sup>1</sup> It is declared that "dædal Nature is the fountain of all arts". For arts proceed from the mind of man; and Nature first gave birth to man with all his faculties. Unless we turn away from her, Nature herself will be present to us in all things. Nature (or the soul of the world, or fate, or necessity, or by whatever other name we may speak of the same power) proceeds from the imperfect to the perfect, and so also does Art, which Nature leads by the hand. Thus—the art of writing being taken as an illustration—men at first wrote on the bark of trees; then succeeded the age that wrote on stone; afterwards the papyrus was used, then parchment, then paper. As there was progress in the materials so also in the instruments of writing; first the knife was used, then the stylus, and so on continually.

This idea again appears in the last book of *De Immenso et Innumerabilibus*. Here a certain reaction from Platonism is perceptible. "Forms without matter," "light without body," are declared to be as absurd as other "separate substances," "abstract species," and "essences without being". The light that the Platonists feign outside things they are told to seek nowhere but in nature and the human mind. The reaction, however, is not from any position taken up by Bruno himself in his first work. It is merely from the use of the language of the Platonists, which expresses his doctrine inadequately so far as it gives the impression that he regards the absolute light, the region of Ideas, as entirely distinct from things. And when we come to the passages

<sup>1</sup> *De Umbris Idearum*, ed. Tugini, pp. 59-64.

containing his doctrine of the divinity of Nature, even the expressions are seen to be almost identical in the two books, though there is an interval of nine years between them.

But the central ideas of Bruno's metaphysics are best seen in the dialogues *Della Causa, Principio et Uno* ("Of the Cause, the Principle and the One"). "The universal intellect" is here declared to be the universal efficient cause. Many names have been given to this cause by philosophers in order to describe its mode of operation. The name that is to be preferred is that of an "internal artist"; for the universal efficient cause gives form to all things from within. The final cause which the universal intellect proposes to itself is the perfection of the world; that is, that all forms shall have actual existence in all parts of matter.

There are two principles of things, "form" and "matter". "Form" as one of the principles of things is to be distinguished from the accidental forms of things. The formal principle is in a manner identical with the efficient cause. For the soul of the world may be regarded now as cause and now as principle. In virtue of the formal principle not only the universe but all its parts are animated. Every portion of matter has its soul or "form". Not all concrete things are alive as such, but all things are alive as regards their substance. The portion of spirit that belongs to any corpuscle is capable of becoming the soul of any kind of animal by receiving the members appropriate to that kind of animal. All motion, all action, is due to the soul or form that is in the universe and in particular things. But there could be no action if there were not something capable of being acted upon, if corresponding to the active power of shaping there were not a passive power or possibility of being shaped in all ways. Hence a second principle or substance of things, "matter," must be assumed in addition to the principle or substance of "form". These two substances are equally eternal. No portion either of material or of spiritual substance can perish. Nothing is ever annihilated except the external and accidental forms of things.

In particular things, "act" and "possibility" do not coincide. No particular thing in the universe is all that it can be. But in the absolute first Principle of things, which is all that it can be, "act" and "possibility" are the same. Material and spiritual substance, "form" and "matter," the active and the passive principle, are therefore, with respect to the whole, identical.

Matter may be considered not only as "possibility" or

"potency" but also as "subject". In itself it has no extended form; it is not restricted to any one mode of being. Just as Art deals with various kinds of matter, each capable of receiving many shapes without change as to its composition, so Nature deals with a matter that is common to all things, both corporeal and incorporeal, both sensible and intelligible, and that remains under all changes the same in substance. This matter which is limited to no specific mode of being is identical with "pure act" and with the efficient cause. It has no particular figure or dimensions because it has them all implicitly. It is said to include all forms rather than to exclude them all, because it does not receive them as from without, but produces them from within. This truth was in part perceived by Aristotle, who makes Nature an internal and not an external principle. But instead of declaring that matter, being permanent, coincides with "act," he places actuality in his "forms" and "entelechies," which are accidental and changing, not truly substantial.

The Infinite, in which matter and form, act and possibility, coincide, contains in itself all being and all modes of being. Each particular thing contains the whole as regards its substances, but has not all modes of being. All evil and imperfection consists in this, that particular things, striving to attain the modes of being which they do not possess, lose one mode of being in order to assume another. In the Infinite all things are one; no quality is different from its opposite; a moment is not different from a century, unity from multitude, a solid from a mathematical point.

The doctrine of the coincidence of contraries, by the help of which the unity of all things is demonstrated, has great importance in Bruno's philosophy. It was suggested to him in the first place by the logical law that "the knowledge of opposites is the same". He quotes the opinion of Heraclitus to the effect that since the One, through the mutability of things, contains in itself all forms, contradictory propositions must be true of it. But he ascribes to Nicholas of Cusa the special mathematical development which he gives to this idea. The treatment of the circle may be taken as an example of his development of Cusa's doctrine. It is shown that in the circle a very small arc coincides with its chord and again that the circumference of an infinite circle coincides with a straight line. Hence, it is argued, contraries—in this case the straight line and the curve—are coincident in the maximum and the minimum. The maximum and the minimum themselves coincide in the infinite,

because where act and possibility are the same everything is that which it is capable of becoming. The point, for example, by motion can become a line, the line a superficies, and the superficies a solid, and all numbers can be produced out of unity; hence unity coincides with infinite number and the point with infinite magnitude. The point and unity were regarded by Pythagoras and Plato as symbols of the one Principle of things. Pythagoras explained the production of things from the one Principle by the analogy of the production of numbers from unity, Plato by the analogy of the production of all figures by the motion of a point. Both these methods may enable the mind to rise to the contemplation of the One; but that of Pythagoras is the best, because numbers have a higher degree of abstraction than figures.

Bruno develops this Pythagorean idea in the book *De Monade, Numero et Figura*. The Monad here symbolises the absolute unity which contains in itself all being, the identity of the maximum and the minimum. The Dyad is the symbol of difference and division, of the contradictions that are found in things. The final reconciliation of all contradictions, the return to unity, is symbolised by the Triad. Other meanings are assigned to the remaining numbers up to the Decad, and to corresponding geometrical figures; but the philosophical bearing of the chapters of this book that follow the fourth (on the Triad) is not very obvious.

In *Della Causa* the one principle manifested in the universe is distinguished from the universe regarded as a manifestation of that principle. The universe or nature<sup>1</sup> is called the shadow or simulacrum of the principle in which act and possibility coincide. There is not absolute coincidence of act and possibility in the universe; it is indeed all that it can be "explicitly"; but its principle is all that it can be "indifferently"; in the one principle there is no distinction of parts. This view of the universe in relation to its principle is explained in more detail in the dialogues *Dell' Infinito, Universo e Mondi*. Here the universe is called an attribute of God. The infinity of God is distinguished from the infinity of the universe. God is declared to be infinitely and totally in the whole world and in each part of it, while the infinity of the universe on the other hand is totally in the whole but not in each part. The eternal existence of an infinite universe and innumerable worlds is inferred from

<sup>1</sup> The word 'Nature' as used by Bruno sometimes means the universe as a manifestation of the divinity, sometimes the divinity manifesting itself in the universe.

the infinite power of God by means of the position already established that in God act and possibility coincide. If one attribute of God were finite, then, it is said, all would be finite. Those who maintain that the universe of matter and space is absolutely limited must be asked by what they suppose it to be limited. If they say by an immaterial world or principle, then it must be replied that a material and an immaterial world cannot form one continuum. Beyond the world in which we live nothing can exist but ethereal space and other worlds of similar composition. From the infinity of the universe of matter and space it follows that it can be acted upon by no cause external to itself.

In this way Bruno connects his metaphysics with the cosmology which he substitutes for that of the Peripatetics. At the same time he attacks the Aristotelian physics and the Ptolemaic astronomy on purely scientific grounds. The hypotheses of mathematicians have, he says, been put in place of reality. But nature ought to be a law to reason, not reason to nature. To those who appeal to the evidence of the senses in favour of the received opinions, he says that it is really from "an imbecility of the reason" that these opinions proceed, and not from the senses. The senses do not deceive; truth and falsehood are in propositions, not in the elements that sense supplies to reason. Sense itself, rightly considered, suggests the notion of an infinite universe; for we have experience of the illusory character of limits such as the visible horizon, and of the appearances of things at a distance. The hypothesis of an eighth sphere containing all the fixed stars is compared to the opinion of one who, being surrounded by trees, should think the seven nearest to be unequally and all the rest equally distant from him because they appear so. The repugnancy of the Peripatetic doctrine of the motion of the heavenly bodies in perfect circles to all that is observed of nature is frequently dwelt on. According to Bruno, though all natural processes are in a sense circular, nothing ever returns precisely to its former state. He ridicules the fancy of the Platonic year, regarding it as a kind of symbol of the opinion that mathematical exactness is observed by nature. He affirms that no mathematical circle exists in nature, any more than a mathematical point or straight line. Each of the planets has one motion which may be resolved into a number of approximately circular motions, but which is itself neither motion in a circle nor in any combination of circles. The heavenly bodies move freely in infinite space; they are not



carried round by spheres. And with the system of the planetary and other spheres the concentric arrangement of the four elements disappears also. In opposition to the Aristotelian doctrine, Bruno argues that the elements have no fixed order of position with respect to one another. They are, besides, never found in nature pure or unmixed. All substances in nature are mixed, and their composition is perpetually changing.

There is no fifth element or "quintessence" in Bruno's system. The stars and planets are not simple bodies, but are of mixed composition like the earth. All the bodies in the universe are made of the same elements or proximate principles as well as of the same primordial matter. In the sun and the stars fire predominates; in the earth and the planets (in which class the comets are included) water predominates. Bodies of the first class shine with their own light, bodies of the second class with a reflected light. But the element of fire is not absent from the earth. And water, being, as Thales taught,<sup>1</sup> the basis of all substances, the common element that binds together the parts of the elements of earth and water, cannot be absent from the sun. Heat and light, besides, are not sensible in themselves. Light, for example, is itself invisible; it is visible only by means of the body in which it inheres. What we call flame or fire is light or heat inherent in a moist body. Hence the sun is not without opacity and coldness as the earth is not without heat and light. The name of "ether" is given by Bruno not to the "quintessence" of which the stars were supposed to be made, but to space as distinguished from matter. He identifies the "immense ethereal space" of his cosmology with the "vacuum" of the Epicureans. Of this vacuum he says "God is the fulness". The "ether," or "heaven," or "space," as distinguished from the bodies it contains, is ingenerable, incorruptible and immovable. Being infinite it has properly no figure; but we may describe it, with Xenophanes, by the similitude of a sphere the centre of which is everywhere and the circumference nowhere.

Since every point of space may in turn be regarded as the centre, all motions may be said to be up or down, towards

<sup>1</sup> Bruno ascribes this doctrine not only to Thales, but also to "Moses and the Babylonians". Water, being an element in which coldness and darkness predominate, is, he argues, the representative of matter in the Mosaic and Babylonian cosmogonies; light or fire, of spirit. He himself often makes the sun the symbol of spirit or form or the active principle in nature; the earth, of matter or the passive principle.

the centre or towards the circumference, according to the point with respect to which they are considered. There is no difference of up and down, central and circumferential, with respect to the infinite universe. Moving bodies may be called light or heavy according as they are in motion to or from any particular point. But there is no absolute difference of "gravity" and "levity," as there is no absolute difference of central and circumferential positions. Bodies on the earth are said to have gravity with respect to the earth, because it is the system of which they are parts. The parts of the earth are related to the centre of the earth as the parts of an animal are related to the organic centre of that animal. If any part of the earth be removed to a great distance from the centre, it will not tend to return to its own place with a force proportional to its distance from that place (as the Peripatetics are obliged to maintain), any more than a part of an animal, being removed, will tend to return to its place. When it is at an indefinite distance from the system of which it has formed part, a body has no tendency to return to that system; for it is now neither light nor heavy with respect to it. Its motion will be determined by the general law that all bodies seek "the place of their preservation". When a body is in "its own place," that is, the place of its preservation, it is again neither light nor heavy.

Neither the material nor the spiritual substance of things seeks to preserve itself or fears to be destroyed, for substance is eternal. But all particular things, being subject to vicissitude, are moved by the desire to preserve themselves in their present state of being (*il desiderio di conservarsi nell' esser presente*). Contraries are found together in nature, and the desire of self-preservation expresses itself in general as love of that which is similar and hate of that which is dissimilar. But things may seek that which is unlike them in kind, instead of fleeing from it, if it tends to their preservation. The motion of the earth, which is called circular to distinguish it from the rectilinear motion of the parts of the earth (though not one of the four motions of which the earth's total motion is composed is in a perfect circle), is determined by the need which the earth has of the light and heat of the sun. Not only is the earth the source of life to the animals on its surface; it is itself an animal. The sun and all planets and stars in the universe are also animals, which, like the earth, though divine and perhaps not destined to perish, are yet generable and corruptible. They differ from the animals on their surface in that they have all

the substance that is necessary for their preservation in themselves, and have not to seek it outside; but they resemble them in this, that they too preserve their life by retaining a certain constancy of form during all changes of the position of their parts. In order that they may remain alive it is necessary that their internal parts should by degrees become external and their external parts internal, that the sea should become land and the land sea; that in short, all parts of them should experience all changes of position.<sup>1</sup> Hence the hot and cold bodies of the universe have need of one another. The earth needs the alternations of light and darkness and of heat and cold that are caused by its diurnal and its annual revolutions, as well as those that take place during longer cycles, in order that all its parts may have all temperatures in turn and that the circulation of matter may be maintained. Thus self-preservation is the final cause of the motion, both rectilinear and circular, of all particular bodies in the universe.

All things are perfect with respect to the order of the universe, but not with respect to the desire of self-preservation that is inherent in each particular thing. Nothing in the universe is in itself either absolutely perfect or absolutely imperfect. God and the universe alone are perfect simply and absolutely. For finite things can only have different modes of being successively; God and the universe have all modes of being at the same time, or rather, without reference to time. As the infinity of God differs from that of the universe, so also the perfection. The perfection of God is in the whole and in every part; the perfection of the universe is in the whole but not in the parts of it taken separately. Things are said to be perfect, not simply and absolutely and in themselves, but in their kind, so far as they attain particular ends. For example, they may be said to be more or less perfect according to the degree of their success in attaining the end of self-preservation. Animals on the earth attain this end imperfectly; for the influx of matter fit to promote their preservation, which is at first greater than the efflux and afterwards becomes equal to it, is at length surpassed by it, and then death of the individual takes place. The heavenly bodies (among which the earth must be numbered) attain the end of self-preservation more perfectly than any other finite things.

The divine will is one with fate. But God acts by the

<sup>1</sup> Bruno finds suggestions of this theory of the "local motion" of the earth in Aristotle. See *Italian Works*, ed. Wagner, i, pp. 192-4.

necessity of his own nature, not by a necessity external to himself in the manner of things that are said to be subject to necessity. In God, therefore, necessity is one with freedom. God always acts in the best possible manner because he has perfect knowledge. If men knew all things perfectly they also would always act in the best way, and therefore all would act in the same way. But the wills of men are everywhere perturbed by passion and by the hidden causes of things (*affectu atque rerum latentia*). Hence they must often hesitate before choosing one of two opposite courses. For this reason the liberty of man must be classed among those things that are subject to uncertainty. It is not fitting that this kind of liberty should be ascribed to God.

In one place Bruno distinguishes between divine necessity or fate and the necessity of nature. Knowledge and will are declared to be identical both in God and in nature. The order that is in natural things is a kind of knowledge—the knowledge that each thing has of that which is similar and of that which is dissimilar. This knowledge is identical with the will to seek the one and to escape from the other. Now in nature different effects are never the effects of the same will or knowledge. But particular effects are not always produced when the will to produce them is present, because they may be prevented by the action of other things. Thus “the necessity of nature” is the necessity which we ascribe to particular laws of nature; “divine necessity” is the necessity by which the whole could not be other than it is.<sup>1</sup>

This doctrine of necessity, and that of the coincidence of will, power and act in God, by which it is connected with the doctrine of the infinity of the universe, are not to be taught to the multitude; for although they are not really dangerous to morals, yet they are sure to be misunderstood by the unlearned. This has been considered by those theologians who ascribe to God a free-will resembling that of man. They have seen that the multitude will never be able to reconcile merit and demerit in the choice of justice or injustice by men with necessity in God. But philosophers in teaching the doctrine of divine necessity do not wish to deny the merit of right actions or the moral freedom of man; and therefore “the not less learned than religious theologians” have always been willing to grant freedom of philosophising, and true philosophers for their part have always been favourable to religions.<sup>2</sup>

<sup>1</sup> *Summa Terminorum metaphysicorum*, Gfrörer, p. 512.

<sup>2</sup> *Dell' Infinito*, Wagner, ii., pp. 26-7.

In defending himself against those who bring arguments from the Bible against the Copernican astronomy, Bruno takes up the position that the Bible is a moral revelation, not a revelation of speculative truth. The object which a wise legislator has in view is, he says, to teach the multitude to choose the good and to avoid the evil. In aiming at this object he speaks in the manner of the vulgar about things that have nothing to do with practice, leaving the further consideration of them to "contemplative men". If he were to use terms understood only by himself and a few others, and to make great case of things that are indifferent to the ends for which laws are ordained, he would be thought to address himself not to the multitude but to "wise and generous spirits," to those who "without law do what they ought". But for these demonstration is required; faith suffices only for the many, for those who cannot act rightly without external law.

The sacred writers, then, must not serve for authorities when they speak as "presupposing in natural things the sense commonly received," "but rather when they speak indifferently," that is, without reference to practice. Regard must be had not only to the words of "divine men" speaking thus, but also "to the enthusiasms of the poets, who with superior light have spoken to us". In accordance with this principle Bruno finds in the *Book of Job* suggestions of some of his physical theories; he often quotes passages from *Ecclesiastes* in support of his doctrine of the permanence of substance; and in the Mosaic cosmogony (as in other cosmogonies) he finds the distinction of matter and form. The speculative parts of all religious systems are for him an exoteric philosophy. In one place he says that the veil which covered the face of Moses, and which signified, according to the Cabbalists, a veil that was over the law, was not for deception, but to prepare the eyes of men for the light, which would cause blindness if they were suddenly to pass into it from darkness.<sup>1</sup>

The essential end of all religions being practice, it follows that they are good in proportion as they encourage right action. This view is developed in the *Spaccio della Bestia trionfante*, a book which, as Bruno explains in the dedication, has for its chief object to lay the foundation of his moral philosophy. It is only in this book and in its sequel, the *Caba'la del Cavallo pegaseo*, that he makes an attack which is direct and at the same time more than incidental on the

<sup>1</sup> *De Umbris Idearum*, ed. Tugini, pp. 33-4.

religion of his age; and this attack is on ethical grounds. The Christianity of the sixteenth century came very far short of his ideal of a religion that should always have ethical ends in view and should not discountenance intellectual liberty. Catholicism seemed to him to exalt credulity and ignorance to the rank of virtues and to discourage scientific curiosity as being in itself evil rather than good; and to Protestantism as a religious system he was less favourable than to Catholicism, for the doctrine of justification by faith seemed to him directly opposed to the true object of a religion. The gods, it is frequently said in the *Spaccio*, ought to be thought of as rewarding the good and punishing the bad actions of men, not for their own sakes, as if they could receive any benefit or injury from their worshippers, but for the sake of men. Laws have been ordained for the good of human society; and because some men do not see the fruit of their merits in this life, there have been placed before their eyes in another life rewards and punishments according to their works.

The *Spaccio della Bestia trionfante* ("Expulsion of the triumphant Beast") is an allegory of which the chief personages are the Greek gods and goddesses. The interlocutors in the dialogues are Saulino—the representative of the philosopher—Wisdom (Sofia), and Mercury. At the beginning of the first dialogue Wisdom relates to Saulino that the gods, finding themselves to have grown old, are offering up prayer to the Fates (although they know that Fate is inexorable), that they may either maintain their present state of being, or, if this is not permitted, then that they may enter into a better and not into a worse state. For Jove and the other gods are subject to change; it may be that they too have to pass the shores of Acheron. And they are afraid that the next great revolution of the world will be quite different from those that have gone before, and will not end in a mere change of dynasty. In order to preserve their existence, they have resolved to put away their vices, and, as a symbol of this change in themselves, to expel from heaven the records of the evil deeds of their youth, and to substitute the moral virtues for the monsters and deified human beings they had formerly placed in the constellations.

The "expulsion of the triumphant beast" from heaven and the assigning of a constellation to each virtue is effected by a council of the gods which is called by Jupiter. The mythological monsters and the heroes who had had places in the constellations along with them are disposed of in various ways. Hercules and Perseus are sent down to the

earth to slay or expel certain new monsters that trouble it. By these the spirit of superstition and religious persecution is signified ; and this expulsion of monsters from the earth is a second meaning of the title of the allegory.

The virtues to which the gods assign the chief places in heaven are, in order of dignity, Truth, Providence or Prudence, Wisdom, Law, and Judgment. Truth is explained in the dialogues to be, in the highest sense, identical with the first Principle of things, with the One and with the Good. This first and highest Truth is superior to Jupiter. Besides the truth that is said to be "before things" as being their cause and principle, there is a truth that is "in things" and a truth that is "after things". The truth that is in things is that by participation in which they have being. The truth that is after things is the knowlege of them as it is in the human mind. Providence is "the companion of Truth," and is identical with liberty and with necessity. In its lower form it is called Prudence, and is the discursive knowledge which the mind has of the order of the universe. Wisdom, like Truth and Providence, has a higher and lower form. Its higher form is identical with Truth and with Providence. Its lower form is not truth itself but participates in truth, as the moon shines by the light of the sun. The first Wisdom is above all things, the second is "communicated by words, elaborated by the arts, polished by discussions, delineated by writing". Law is the daughter of Wisdom. It is by Law that states are maintained. No law is to be accepted that has not for its end to direct the actions of men in such a way that they may be useful to human society. Next to Law has been placed Judgment, into whose hands Jove has put the sword and the crown, for the punishment of the bad and the reward of the good. By the representative of this virtue services and injuries done to the commonwealth are to be judged greater than all others ; internal sins are to be judged sins only so far as they are capable of having an external effect ; repentance is to be approved but not to be esteemed equal to innocence.

That which is brought out most clearly in this distribution of the chief virtues is the importance that Bruno attaches to knowledge as an essential condition of right action. The distribution of the virtues that follow judgment has less purely philosophical interest ; but the discussions of particular virtues help to show us what was Bruno's moral ideal. They display his admiration for the illustrious characters of Greece and Rome and his preference of the antique type of the hero to the mediæval type of the saint.



It has already been seen that Bruno regarded the supernatural sanction of morality as having some value for those whose actions must be regulated by external law. Since the fear of human justice is not sufficient to repress wrongdoers, it has been necessary, in his view, that the fear of divine justice should be added. The anthropomorphic gods may preserve their existence by doing reverence to the Truth that is above them and by making themselves the guardians of morality.

An episode of the *Spaccio* which has much interest in relation to Bruno's philosophy of religion is the discussion of Greek and Egyptian polytheism in the third dialogue. It is contended that both the Greeks and the Egyptians worshipped under many forms the one divinity that is latent in all things; the Egyptians chiefly under the forms of animals, the Greeks chiefly under the forms of men. Jupiter was once a king of Crete and a mortal man; the name of Jupiter was given to the divinity seen under a certain aspect, not because it was supposed that the mortal Jupiter was a god, but because it was held that the divinity was in Jupiter as in all things, and because in the extraordinary magnanimity or justice of Jupiter was seen the magnanimity or justice of the divinity. As the Greeks gave the names of men who had once lived on earth, and in whom more than in others certain divine qualities had been present, to particular aspects of the divinity, so the Egyptians gave the names of various animals to aspects of the same divinity manifested in its descent to the production of natural things. It is maintained by Isis in the assembly of the gods that the wisdom of the Egyptians consisted in knowledge of the processes by which the life that is manifested in the multiplicity of things returns to its source, and that this knowledge was embodied in the Egyptian religion. The Greek and Egyptian deities complain that the Jews and the Christians, having really fallen into the errors from which their own worshippers have been proved to be exempt, and being besides open to every accusation they can bring against others, yet reproach with idolatry those whose knowledge of the divinity was far greater than theirs. Isis declares that the followers of new religions have triumphed, not by their own merits, but because fate, in the vicissitudes of things, gives its time to darkness. The prophecy is ascribed to Hermes Trismegistus, that after the ancient religions have fallen there shall come a time when darkness shall be preferred to light and death to life, when those who attach themselves to "the religion of the mind" shall not be per-

mitted to live; but after these things have happened the world shall by some new revolution be restored to its ancient countenance.

In all this it is clear that Bruno regarded those religions from which the pantheistic view of nature had not disappeared as more favourable to the true philosophy than the monotheistic religions; but these passages must not be understood as a direct attack on Judaism or Christianity. To aim directly at the subversion of the popular religion because it was unfavourable to the true philosophy would have been inconsistent with his view that the end of all religions is properly ethical. The difference between the positions he takes up when he is considering religions from the point of view of ethics and when he is considering them from the point of view of his philosophy of nature is seen in this: that the goddess of Wisdom is represented as expecting the return of light in Europe after a long period of darkness, but as not having control over the vicissitudes by which the alternation of light and darkness is caused, while Judgment on the other hand is directly charged by the gods to destroy those forms of opinion that represent them as indifferent to the actions of men and caring only for their beliefs.

Some have found in the *Eroici Furori* an expression of Bruno's esoteric religion. This term, however, does not seem to be strictly applicable here; for Bruno always associates religion with ethics, and he distinguishes the "infinite aspiration" which is the subject of the *Eroici Furori* from "virtue" as defined by him in the same book.<sup>1</sup> His definition of virtue is founded on his theory of pleasure and pain. According to this theory all pleasure consists in a certain transition, and is pleasure only by contrast with a state of pain that has preceded it. Since in this transition, as in all motion, contraries coincide, since the end of one of two contrary states is the beginning of the other, there can be no pleasure without mixture of pain. At the highest point of pain or of pleasure the wise man always expects a reversal of his state. By considering the mutability of things he may at length arrive at indifference to all pleasures and pains. It is in this indifference that perfect virtue consists.<sup>2</sup> As the wise man is set free from subjection to

<sup>1</sup> Part i., Dialogue 2.

<sup>2</sup> Bruno does not deduce the particular virtues from his definition of the ideal virtue which is the result of the contemplation of philosophic truth. It has been shown by Hartung that Aristotle's doctrine of the mean has had more influence on the definitions of particular virtues in the *Spaccio* than any other general principle.

pleasures and pains by the knowledge that in the vicissitudes of things all states are at length reversed, so he is set free from subjection to the desire of self-preservation by the knowledge that nothing which is substantial can truly perish. This liberation from "the fear of fortune and death" is often described by Bruno as one of the chief results of his philosophy. It is conceived as an ethical state, since the disposition of the wise man with respect to mutable things is identified with virtue. At the same time it is not regarded as attainable by the mere practice of morality, but only by the contemplation of philosophic truth; and this is accessible only to the few.<sup>1</sup> To this outcome of Bruno's philosophy the name of an esoteric religion may properly be given. He himself contrasts it with the "vain fear and desperation" caused in "stupid and ignorant souls" by "foolish faith and blind credulity".<sup>2</sup>

In the *Eroici Furori* it is not the ethical effect of the contemplation of truth, but the pursuit of truth in itself that is described. The *eroico furore* is first of all the desire of absolute truth. It is said to be different from other *furori* not as a virtue from a defect, but as a defect that is in a more divine subject or that is present in a more divine manner. The *eroico furioso* resembles the ideally wise or virtuous man in having escaped from subjection to the desire of self-preservation and to common pleasures and pains; but he differs from him in this, that in the pursuit of his object he never attains the point of indifference. He has no sooner perceived truth under any one form than he perceives the limits of that form. Thus he is constantly impelled to go beyond that which he possesses; for the mind cannot rest satisfied with a knowledge that is limited and therefore imperfect. Since knowledge is impossible except under limits, he is always in motion between the extremes of pleasure and pain.

The *eroico furore* is sometimes described as an "intellectual love". It includes not only the desire of absolute truth, but also the desire of absolute beauty. This desire is excited by the beauty which is perceived in particular forms, and which is one of the manifestations of the soul of the world. But beauty, like truth, can only be perceived under limits beyond which the mind is impelled to pass; and therefore the pursuit of beauty also is a pursuit of which the end can never be attained.

<sup>1</sup> See for example the opening of the seventh book of *De Immenso*.

<sup>2</sup> *Spaccio della Bestia trionfante*, Wagner, ii., p. 241.

Sometimes, however, the end of the aspiration of the *eroico furioso* is spoken of as if its attainment were possible. It is then called "beatitude," and is said to consist in transformation or absorption into the object contemplated. Beatitude is also represented, in at least one place, as accompanying complete virtue. The doctrine of Epicurus is interpreted in the sense that virtue and the divine or heroic love are imperfect unless a feeling of happiness has been joined to them which no evil is able to take away.<sup>1</sup>

It is to be observed that the use of the word 'matter' in the dialogues that have just been considered differs from the use of the same word in *Della Causa*. Matter, in the *Eroici Furori*, instead of being described as that which produces from itself forms which it contains implicitly, is described in the manner of the Platonists, as that which impedes the ascent of the spirit. Bruno was not unconscious of this difference. He suggests the explanation of it himself in the dedication of the *Eroici Furori*, and in other places. It is a difference of expression that is explained by his doctrine of "the circle of ascent and descent". The forms that are emerging from "all-productive matter" seem to themselves to be impeded by it, because of the necessity they are under of passing through intermediate forms before reaching those that are highest. And the forms that are descending in the scale of being seem to themselves to be obeying an attraction towards "a less good," when they lose in the multiplicity of "the imagination" the unity of "the mind". If, on the other hand, the process of change is looked at as it were from the outside, it is seen that both the ascent and the descent of beings are determined by "the necessity of an internal law".

Not only does the idea of two kinds of change undergone in perpetual alternation by all forms of things supply the explanation of differences of expression as regards 'matter' that are met with in Bruno's works, but, as has been already indicated, the doctrines of the 'soul of the world' and of the absolute mind or intellect, which have been supposed by some to belong to different stages of his thought, are united by this idea. The theory of metempsychosis which is developed chiefly in the *Eroici Furori*, but which appears also in the *Spaccio* and in the *Cabala del Cavallo pegaseo*, is in part an expression of this idea in the form of a kind of philosophic myth. At the same time a concrete form is given to

<sup>1</sup> Wagner, ii., pp. 366-7.

other ideas by means of it, and in particular to the doctrine of the permanence of mind.

Bruno finds the elements of his theory of metempsychosis in the traditions as to the teachings of the Druids, the Chaldæans, and the Magians, in the opinions ascribed to Pythagoras, and in the doctrines of certain Jewish sects and of some of the Platonic schools. He represents the souls of men, of animals, and even of things commonly called lifeless, as alike in substance and differing only as to the kind of body they have last received. According to the nature of their deeds and aspirations when dwelling in one body will be the nature of their next embodiment. Each soul modifies the shape of the material substance of its own body as it becomes itself better or worse. Thus from the outward forms of men it may be known whether their next embodiment will be of a higher or of a lower kind. In the eternal metamorphoses of matter all souls receive all corporeal forms. No soul ever reaches a final state; all alternately approach and recede from the unity of the absolute intellect, become subject to matter and escape from it. This is figured in mythologies by the legends of gods that have assumed the shapes of beasts and at length by their innate nobility resumed their own forms. Those who aspire to the divinity by intellectual love may be described as changing themselves into gods. That metamorphosis is of all things and is eternal, and that all souls must return from the highest to the lowest and again from the lowest to the highest state, has been taught by all the great philosophers except Plotinus. All the great theologians, on the other hand, with the exception of Origen, have taught that metamorphosis is neither of all things nor eternal, but that those changes which are undergone by a certain number of souls have a period. The doctrine of the theologians is fit to be taught to those who, being now with difficulty restrained from evil, would be restrained with still more difficulty if they came to believe themselves subject to some lighter conditions of reward and punishment.<sup>1</sup> But that doctrine is to be esteemed true which is taught by "those who speak according to natural reason among the few, the good and the wise".

It is clear from many incidental expressions that, as Bartholmæss says, Bruno does not advance the theory of metempsychosis as a positive doctrine. Yet, as has been seen,

<sup>1</sup> Wagner, ii., p. 309. Bruno, however, does not always admit even the utility of the theological dogma in question here. See *De Immenso*, vii., c. 11.

he conveys under the imaginative form of this theory some of the principal ideas of his philosophy. From his mode of combining the idea of metempsychosis with that of metamorphosis it may be inferred that his doctrine of "the immortality of the soul" is not a doctrine of personal immortality. This indeed is evident from the frequency with which he speaks of the souls as drinking of Lethe before passing into a new state of existence. Of this idea as well as of his doctrine of "the soul of the world" he finds an expression in Virgil; and he finds it in the passage from which he has taken the lines that have already been quoted, —in the speech of Anchises which, according to tradition, contains an account of the doctrines of Pythagoras.<sup>1</sup> Virgil in the latter part of this passage makes Anchises tell how the souls that have attained Elysium become willing to enter into new bodies.

Has omnes, ubi mille rotam volvere per annos,  
Lethaeum ad fluvium Deus evocat agmine magno;  
Scilicet immemores, supera ut convexa revisant,  
Rursus et incipiant in corpora velle reverti.

Or as Bruno expresses it in the language of his own philosophy, the transmigrating souls, by the compassion of Fate, are caused to drink of the waters of Lethe before receiving new forms, in order that they may suffer as little pain as possible from the inevitable contradiction of their desire to maintain their states, and that after every change of embodiment they may remain equally desirous of preserving themselves in their new state of being.

In the foregoing article the aim has been to explain the ideas of Bruno in their relations to one another. Before continuing the study by any attempt at a critical estimate, it seems well to wait for the appearance of the book on "The Life and Works of Giordano Bruno" which has been for some time announced by Messrs. Trübner.

<sup>1</sup> *Aeneid*, vi., 724-751.—Bruno refers to Virgil as the "Pythagorean poet".

## VI.—DISCUSSION.

### ON THE CLASSIFICATION OF THE SCIENCES.

By H. M. STANLEY.

The subject of the Classification of the Sciences has received considerable attention from philosophers, from Plato down to Mr. H. Spencer, but yet we have no generally received classification, and are, perhaps, not likely to have one. Prof. Jowett thus comments on the subject in the introduction to his translation of Plato's *Sophist*.—

“In several of the later dialogues Plato is occupied with the connexion of the sciences, which in the *Philebus* he divides into two classes of pure and applied, adding to them as elsewhere (*Phaedr.*, *Crat.*, *Rep.*, *Polit.*) a superintending science of dialectic. This is the origin of Aristotle's Architectonic, which seems, however, to have passed into an imaginary science of essence, and no longer to retain any relation to other branches of knowledge. Of such a science, whether described as ‘*philosophia prima*,’ the science of *oûsia*, logic, or metaphysic, philosophers have often dreamed. But even now the time has not arrived when the anticipation of Plato can be realised. Though many a thinker has framed a hierarchy of the sciences, no one has as yet found the higher science which arrays them in harmonious order, giving to the organic and inorganic, to the physical and moral, their respective limits, and showing how they all work together in the world and in man.”

Among recent systems of the sciences, those of Auguste Comte and Mr. Spencer have deservedly received special attention. Comte's classification has been searchingly and severely criticised by Mr. Spencer in his *Classification of the Sciences*, and by his disciple, Mr. John Fiske, in *Cosmic Philosophy*. Mr. Spencer's scheme has been acutely criticised by Prof. Bain in the appendix to his *Logic*, vol. i., and by Chauncey Wright in an article on the Spencerian Philosophy in the *North American Review*. While we may not admit all the sweeping criticisms made upon Comte by Mr. Spencer and others, still we must admit that Comte's plan of the sciences has been shown to be quite imperfect; while Comte's scheme was superior to all that had preceded, in that he clearly laid down certain scientific principles, historical and logical, quite in contrast to the fancifulness of many previous classifiers. Still, in his love for wide generalisation, he made his greatest mistake, we think, when he attempted to found his classification upon the concurrence of many principles, instead of rigidly adhering to a single principle. He tried to classify according to all his principles at once, and he was bent on seeing only what would fit into his conceptions. His whole scheme is carried out in a spirit far too deductive. The truth is, as Mr. Spencer has shown, that



a thorough following out of his principles would bring discordant classifications; that the order of dependence, for instance, is very complex, and far different from that of historic development. We would add, further, that the form of the order of historic development is ramifying, and not linear as Comte supposed.

As Comte made an advance on all previous classifiers in adopting clearly defined and scientific principles of classification, so Mr. Spencer made an advance upon him in classifying, not by many principles, but by a single principle, that of increasing concreteness. Prof. Bain justly criticises his scheme as too revolutionary and far-fetched, as well as lacking in exactness. Chauncey Wright criticises it as merely adding useless terms for divisions of the sciences already recognised by a proper nomenclature. The Abstract, Abstract-Concrete, and Concrete Sciences of Mr. Spencer are, in his view, simply equivalent to the old distinctions of Formal, Mixed, and Material Sciences.

There is one thought with reference to the plans of Comte and Mr. Spencer which is of interest and which we will note here, and that is the relation of their principles of classification to certain educational principles or laws of mental growth. Mr. Spencer exhibits an order from abstract to concrete, and the well recognised order of intellectual growth is the reverse, from concrete to abstract. Comte's classification claims to represent the order from simple to complex, and from general to special, and the order of mental growth is the first as stated, and the second reversed. We should expect that the order of individual mental progress would fairly represent the order of the progress of the race in the sciences, but this is plainly not the case. Mathematics, for instance, the earliest of the sciences in developing, dealt with the most simple but with the most general and abstract of notions. Its rapid progress was due in great measure to progress according to the law of least mental resistance. It was easier for the mind to work out an ideal world of form, than to patiently make inductions among the complexities and perplexities of the actual world of things.

Without commenting further on the classifications of Comte and Mr. Spencer, let us approach the subject for independent study from a logical point of view. In treating any subject we assume that it is the first work to define the subject, to attain a clear idea of the material with which we are to deal.

In forming a classification of the sciences it is a preliminary step of prime importance to decide what departments of knowledge are to be considered as sciences. What is a science? For lack of a clear understanding with reference to this fundamental question there has been much confusion, since even accurate writers use the term science in radically different meanings. Some claim that Political Economy is not yet a science, and many assert that it is. Different writers, having different conceptions of what constitutes a science, have assigned different

dates to the birth of Geology and other sciences. Professor Huxley defines science as "organised common sense," and Mr. Spencer as "partially unified knowledge". Science has also been defined as systematised knowledge, rationalised knowledge, verified knowledge, classified knowledge, &c. It seems to us that such definitions are difficult of application, and we would define science historically as the knowledge of any department resulting from intelligent and special investigation, according to a rigid method. It is thus distinguished from ordinary knowledge by the rigidity of the method, and the special and intelligent attention given. As soon as any intelligent worker gives any results of investigation in any particular line we have the nucleus of a science. M. Pouchet well remarks: "A science is founded as soon as a fact, whatever it may be, is well settled. It forms a point whence we set out on new discoveries, until another and broader one has been found." Adam Smith organised the science of Political Economy, but Aristotle and others, centuries before, left results of intelligent investigation in this field. The one who brings the first material for the building of a house is building it as truly as the architect who designs the whole. The difference between the house and the science is this, that a great deal of material for a science is collected long before the architect makes his appearance, while in the case of the house the material is collected at the instance of the architect. All sciences have a descriptive or natural history stage of growth before they arrive at the period of organic growth, and organic growth often proceeds for many years before the science receives general recognition as an organised science.

Classifications of the sciences may evidently be either *historical* or *logical*. An *historical* classification would show the sciences in the order of genesis, and this view of the subject would belong to the science of the history of the sciences. This is a science which has been too little cultivated. Dr. Whewell made some progress in this line of study in his *History of the Inductive Sciences*, but this was only a partial treatment, and, moreover, we have a vast amount of material which was not open to him. The science of the history of the sciences may be conceived as in some measure the correlative of the science of religions. Religions are bodies of belief concerning God and a future life, and the science of the history of religions investigates the genesis, growth and relationships of these bodies of beliefs. Sciences are bodies of beliefs concerning nature, man, and God, arrived at by rigid method and intelligent and special attention; and the science of the history of the sciences investigates their genesis, growth and relationships. The history of science is thus a legitimate historical science correlated with the history of religion and the history of philosophy. In tracing the rise and progress of the sciences we should find that a genetic classification would be in ramifying form rather than linear, would present the ap-

pearance of a tree with intertwining branches, rather than of an upright pillar. The genetic classifications of organisms and languages, and all genealogies present this ramifying order. It was a mistake in Comte to suppose that a linear order could represent an evolution. Owing to the many circumstances, social, political, and religious, which have influenced the appearance of the sciences, in their organised as well as their descriptive stage, a classification according to historic development presents great difficulties. Both Mr. Spencer and Mr. Fiske have very justly insisted on the complexity of influence. We hope, however, that in these days of enthusiastic historical research some one may be found to give to the history of the sciences the attention it deserves, and bring out clearly a genetic classification and the laws of the growth of the sciences.

It may not be amiss here to turn aside and consider a law of the growth of the sciences which seems to me of some importance, and that is the law of growth from *static* to *dynamic*. This has been hinted at by Prof. Joseph Le Conte and others, but has not yet received the discussion which it merits. This is a law of progress, not only in scientific, but also in ordinary and philosophic knowledge. Ordinary observation naturally proceeds from noticing what things are to observing, or more frequently guessing as to, how things have become what they are. Mythologies and folk-lore have, to a great extent, grown up in this way. Philosophy in Greece speculated as to how things have become what they are, and set forth water, fire, and air as primal elements. In science the ancients were mostly confined to the descriptive stage; there were no scientific theories of atoms and evolution, only philosophic hypotheses; and the sciences remained for the most part undetached from their mother philosophy. After the moderns had caught up the broken thread of past culture, they began to observe for themselves, and descriptive science progressed very rapidly. Great advances were early made in Geography, the static science which treats of the earth as it is; but geology, the dynamic science of how the earth became what it is, rapidly developed at a much later period. Static Astronomy grew up under the labour of Copernicus, Galileo, and Kepler, but it was reserved for Kant and La Place to propound the nebular theory of the development of celestial bodies and systems. Physics has, within comparatively recent times, received its dynamic complement in the theory of the convertibility of forces. Mr. Norman Lockyer's recent hypothesis of the convertibility of the elements has in it a gleam of promise that we may yet know the history of the elements. Botany and Zoology, the sciences of plants and animals as being, are now supplemented by Biology, the science of organisms as becoming. Human Psychology was long a simple static science of mind, but Paedagogy, as the science of education, the science of mental growth, and, applied as an art, the art of inducing mental growth, is now fast becoming the

correlative dynamic science of mind. Grammar and Lexicography have long studied structure and function in language, but Glossology now investigates genesis and growth. History has long presented little else than panoramic views, pictures of how society was, but Sociology would set forth society as a growing organism. The idea of evolution is now fast permeating even Theology, although it is, of course, subjective evolution, an evolution not in the object-matter but in the ideas of the object-matter. Biblical Theology is now tracing the growth of religious ideas in the *Old* and *New Testaments*; and the sciences of comparative religion and mythology are tracing the growth of religious ideas in general. The following tabular outline, which may in some sense be termed an historical classification of the sciences, may be of service:—

STATIC SCIENCES.	DYNAMIC SCIENCES.
Geography.	Geology.
Astronomy.	Nebular Theory.
Physics.	Theory of Convertibility of Forces.
Chemistry.	Lockyer's Hypothesis.
Zoology and Botany.	Biology.
Psychology.	Paedagogy.
Grammar and Lexicography.	Glossology.
History.	Sociology.
Theology.	Science of Religion.
SCIENCES OF BEING.	SCIENCES OF BECOMING.
SCIENCES OF STRUCTURE	SCIENCES OF GROWTH.
AND FUNCTION.	

Although Mathematics is not placed in the above scheme, yet dynamic conceptions, such as the theory of fluxions, have played an important part in its later growth. Kant strongly insisted on the distinction between "Physiography" and "Physiogeny," descriptive and genealogical science, corresponding to these divisions into static and dynamic science. All the sciences are pressing forward to, or have already attained, the evolutionary or dynamic stage of progress, and the idea of evolution is becoming a ruling idea in the world of science.

If every science has static and dynamic divisions, it would seem best to indicate the fact by an appropriate terminology. If we take Geology in the literal sense as the science of the earth, we have Geography, the science of structure and function of the earth, as its static division, and Geogeny, the science of the growth of the earth, as its dynamic division. The terminations *logy*, *graphy*, and *geny* might, perhaps, be extended to all the sciences, giving what is assuredly much needed, something like a scientific terminology to the sciences.

Having thus considered, in a general way, historical classification, and a law of historical growth of the sciences, let us next consider *logical* classifications. Classifications based on such principles as dependence, increasing concreteness, generality,

and complexity, are logical classifications, and should not be confounded or identified with historical classifications. Logical classifications are undoubtedly to be placed under the domain of philosophy, though we sometimes see them connected with systems of logic. Every complete system of philosophy would naturally include a classification of the sciences; and within the last century especially it has seemed necessary to philosophers to bring their universal principle to bear on a classification of the sciences. Every system of philosophy, as seeking to account for all phenomena by a single unifying principle, must include the sciences as anthropological phenomena. Hegel gives us a complete classification from the point of view of his philosophy, as also does Comte. Mr. Spencer's classification of the sciences does not seem to be in any vital connexion with his system of philosophy. He uses, as the principle of his classification, increasing concreteness, whereas, the prime principle of his philosophy being evolution, it would be in consonance with his philosophy that he should give this as the principle of classification, thus attaining the evolutionary or genetic classification of which we have already spoken.

The best principle for a logical classification must be the simplest and most comprehensive, and it will be the aim of the rest of this article to set forth what we may term the unitary principle of classification, as one which may have some value. The fact that there are different levels in nature, the higher dependent on and made up of the lower, has often been noticed, but it has never been applied to a classification of the sciences. Science has certainly been revealing more and more clearly that nature is a system of interdependent aggregations of units, and the sciences will, we think, be found to have been gradually determining themselves as to subject-matter with reference to these units. Mr. Spencer frequently refers to this conception, but never makes use of it as a principle of classification. For instance, we take the following extract from *First Principles*, pp. 383, 384 :—

"The automatic movements of the viscera, together with the voluntary movements of the limbs and body at large, arise at the expense of certain molecular movements throughout the nervous and muscular tissues, and these originally arose at the expense of certain other molecular movements propagated by the sun to the earth; so that both the structural and functional motions which organic evolution displays are motions of aggregates generated by the arrested motions of units. Even with the aggregate of these aggregates the same rule holds. For among associated men the progress is ever towards a merging of individual actions in the actions of corporate bodies. While, then, during evolution, the escaping motion becomes, by perpetually widening dispersion, more disintegrated, the motion that is for a time retained becomes more integrated. And so, considered dynamically, evolution is a decrease in the relative movements of parts, and an increase in the relative movements of wholes—using the words parts and wholes in their most general sense. The advance is from

the motions of simple molecules to the motions of compound molecules, from molecular motions to the motions of masses, and from the motions of smaller masses to the motions of larger masses."

There may be compared with this extract *Biology*, p. 109, and *Classification of the Sciences*, *passim*. But we shall seek to trace this principle as helpful in a classification of the sciences.

The units which are, no doubt, fundamental to all others are the units of number and form of which mathematics treats. From the integer one all numbers arise, and by the motion of a point all forms arise. Mathematical units and aggregates are ideal, or rather are imperfectly actualised. In a classification according to the principle adopted we should best regard Mathematics, not as constitutive, but as concomitant with the other sciences, as presenting an ascending series of increasingly complex units concomitant with the sciences; and in the scheme subjoined to this explanation we have so placed it. The mathematics of a molecule is more complex than that of an atom; and we know that the highest forms of matter present the most complex curves. Clifford and others have speculated as to what order of curves an investigation of the phenomena of life requires. The most refined piece of matter in existence is the human brain, and it presents, no doubt, mathematical complexities of a very high order. At each increasingly complex stage in nature there is, then, a corresponding mathematical stage, whose complexity is measured by the combination of simpler elements.

The atom is confessedly the lowest unit which science has yet revealed, but it is quite conceivable that we may yet find an atomecule which shall bear the same relation to the atom which the molecule does to the mass. It is the unit of chemical forces, and Chemistry may be defined as the science of the atom. Molecules are aggregates of atoms, and are the units of physical forces; hence we have Molecular Physics as a branch of science. Molecules are aggregated into masses, which act under molecular forces as units, as when the piston is moved by the molecular energy of the steam in the cylinder. Masses are rendered possible by the dissipation of molecular energy, and even gravitation may possibly be considered as the tendency to massing inevitably arising from the dissipation of energy. As dissipation is continually increasing, gravitative tendency is continually increasing, although restrained by the original projectile force. We would divide masses into *orbital* and *non-orbital*, the orbital being those which perform an orbit in the heavens, and the non-orbital those which rest on the orbital, and have been differentiated from them. Astronomy and Geology treat of the first class of masses. The distinction between these sciences is, as Mr. Spencer remarks, non-essential and relative: Geology, as the science of the earth, treats of that heavenly body with which we happen to be best acquainted. Non-orbital masses are subject to Molar Physics. Viewing a mass as an aggregate of molecules bound together by

cohesion into a whole capable of motion, and having definite form and size, we may distinguish molar, molecular, and atomic stages in the history of matter. The moon, without atmosphere and water, seems to be wholly molar, while the earth is mostly molar though still in the molecular stage as regards air and the partially molar water. The sun is probably mostly molecular and atomic, while a nebula may be wholly atomic. With the diffusion of the high nebular energy, atoms are aggregated into molecules, and molecules into masses.

The non-orbital mass is really sub-mass; and the first non-orbital masses upon the earth were igneous rocks. These sub-masses were reduced to a long series of sub-masses, whence, according to the evolution-hypothesis, arises the living man. This is, as Prof. Du Bois Reymond says, a mass noted for its unstable equilibrium, a stream of matter constantly flowing through it, and its life consisting in intercommunication. The living sub-masses are known in simplest form as cells or, we would suggest as a more appropriate name, biocules. The science of the cell and cell-aggregates—plants and animals—is Biology. Here there seems to be a break with reference to the principle of aggregation of units, for the cell is not an aggregate of masses into a higher unit, as the mass is a higher unit than the molecule; but the advance to a higher form of matter may be regarded as due to a new combination of forces. Within the domain of life we find aggregates and aggregates of aggregates, both in the individual and in the collective body of individuals—in the individual known as organs and tissues, in the collective mass known as classes, orders, families, &c.

One animal, man, is distinguished from others by the possession of a unique power over nature arising from a unique intelligence. Man certainly forms a more distinct and marked stage of creation than any which has preceded in that he surveys the whole, but he is, besides an animal, a man, an aggregation of molecules and atoms. Man, although he is a complex of aggregates of aggregates, does not seem to be man by virtue of this law of aggregates, for in this he does not seem to differ radically from other animals. He is the animal in which psychical force, in distinction from physical force, comes to be a grand and dominant factor; hence the peculiar science of individual man is Psychology, while the study of the structure, functions, and growth of man's body is properly referred to Biology.

Sociology deals with the very difficult and complex subject of aggregates of human individuals. Human society is composed of societies, states, religious bodies, and the like; and these again of subordinate organisations, and so on down to the individual unit. This complexity is increased by the individual becoming a member of different societies. In all this wheel within wheel of societies the individual is the constant unit to which reference must be made, just as, in the investigation of molecules, reference



must be continually made to their constituent atoms. The action of a society is the resultant of the actions of the individual members; thus, a change in the body politic, for instance, is the resultant of the changes of its component individuals acting and reacting on each other, just as a change in a molecule is the resultant of the changes of its component atoms. The problem of Sociology is then, as we take it, to trace changes in society to their immediate causes in the actions of constituent societies, and to their ultimate causes in the actions of individuals; and to discover the laws of these changes. Comparative Psychology and Sociology, as dealing with sub-human life, are subordinate to Psychology and Sociology.

But man rises, even according to Mr. Spencer, to an unknowable reality, or, as the theist believes, to a knowable personal God; but, according to both theist and pantheist, these aggregates of aggregates find their final unity in God.

We place below a tabular outline of the sciences as we have treated them:—

Mathematics.	Chemistry.	Science of Atom.
	Molecular Physics.	Science of Molecule.
	Molar Physics.	Science of Mass.
	Biology.	Science of Aggregated Cell-Masses.
	Psychology.	Science of Individual Man.
	Sociology.	Science of Human Aggregates.
	Theology.	Science of God.

The order of aggregation plainly is: atoms into molecules, molecules into masses, cell-masses into plants, animals, and men, and these into societies. Nature is thus a combination of wheels within wheels. This classification presents the general order of the dependence of the sciences. If we wish, for instance, to study in Sociology the family, there will be necessarily presupposed a knowledge of the human individual as a psychical whole; and this presupposes a study of the human animal, and this of the cell, and this of masses, molecules, and atoms. Herein is a "hierarchy of the sciences". If this be the order of dependence of the sciences, it must also be the order of their completion, the higher sciences necessarily waiting on the lower. Again, it is also the order of increasing complexity, as has been exemplified throughout. It is also the order of increasing speciality and concreteness, in that it is a logical order of increasing intension and decreasing extension. A number of objects decrease, and number of attributes increase. It is also the order of recognised rank. As bearing on these points we quote the following passage from M. Th. Ribot's *Heredity*, p. 193:—

"The philosophers of the present century have shown (and the positivist school has performed a fair proportion of the work) that the sciences are not isolated systems of doctrine, each detached from each, but that there exists among them a hierarchical subordination, so that the more complex rest on the more simple, and presuppose them. The mathematical, physi-

cal, biological, moral, and social sciences represent so many phases of a continuous process, which advances from the simple to the complex. Social phenomena presuppose thought and sensation, these presuppose life, life presupposes physical and chemical conditions, physical and chemical facts presuppose mathematical conditions, time, space, and quantity, which are simply the most vague and general conditions of existence. In this series of an increasing complexity, and of a decreasing comprehensiveness, it would be folly to imagine that the superior sciences could exist before the inferior sciences were constituted. But quantitative determination exists only in mathematics, and to some extent in physics. It has not yet penetrated into biology. How, then, could it have attained to the moral and social sciences? It is, perhaps, doubtful if it will ever reach them."

As we understand M. Ribot, he would make Mathematics not concomitant, but constitutive, with the sciences; and this is also the opinion, if we mistake not, of W. K. Clifford.

This principle of aggregates, which we have sought to apply on a suggestive principle in the classification of the sciences, does, of course, assume ordinary scientific realism, and rests upon ordinary inductive interpretation. It is according to the ascending method in philosophy, the method of working up to man, rather than the descending method, that of working out and down from man, and it is subject to all the defects of that method; still the principle is, we believe, fertile and suggestive.

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#### GOING BACK TO KANT.

By GEORGE J. STOKES.

In the present day a cry is frequently raised, that it is necessary to go back to Kant. The later German philosophers appear to many to have led into a visionary realm of fiction, a region of absolute illusionism. But from the idealistic extravagance of Fichte, Schelling, and Hegel, Kant is free. His world has a solid basis of *given* fact supporting it, and the reader feels that he is on *terra firma*. It is scarcely worth inquiring whether this conviction does not rest more on instinct than insight. A more important question is, whether it admits of justification. Can we retain the first principle of the Kantian philosophy and at the same time maintain the existence of a thing-in-itself distinct from and over against thought upon which thought in experience depends? The answer must be Yes and No. If we accept the fundamental thought of the Kantian Philosophy, the principle upon which he explains the possibility of *a priori* synthesis, as that principle has been stated by Kant, then it is perfectly true that the Critical Philosophy is no possible halting-place of thought and we must advance to the full development of the idealistic principle from which it starts. But if, on the other hand, we modify the fundamental thought of Kant by demonstrating the presence of the

opposite principle in the very heart of that thought, then perhaps it will appear that the *Ding-an-sich* is not such an irrational element in the philosophy of Kant as his critics suppose, but springs from a deep-seated need lying hid in the very principle with which it apparently conflicts. The exact form in which this conception appears in Kant may have to be given up, but the truth which it expresses, the dependence of thought upon fact which determines rather than is determined by thought, will remain. To demonstrate that this is the case we cannot leave out of sight the work of subsequent speculation. What we propose to do is rather to show that idealistic speculation although it may not understand it carries Realism in its womb.

It is not enough to insist upon the necessity of going back to Kant. All depends upon the way in which we go back to him, and there are different ways of going back. If we glance for a moment at the last century, it is easy to conceive a similar feeling arising with regard to Locke, and Berkeley and Hume. Many who saw the external world disappear in the subjective idealism of Berkeley, and rational truth disappear in the sceptical phenomenalism of Hume, must have felt strongly that there was a necessity for going back to Locke. Locke must be studied again, they would say; the simple common sense of the *Essay on the Human Understanding* can lead to no such results; and accordingly a going back to Locke did take place—with great consequences for the history of philosophy. Kant went back to Locke, and studied again the problem of Locke, but he went back with a full and perfect consciousness of the subtle question Hume had asked, of the hidden problem of which his philosophy was the expression.

If a going back to Kant is to take place with fruitful results it must be made in the same way. Just as Kant went back to the problem of Locke and raised the question—Is it really true that all our knowledge not merely begins with experience but also arises out of experience? so it is necessary now to go back to the problem of Kant, and to inquire whether the presupposition under which Kant solved that problem is really true and is really necessary. The problem of Kant was the problem of synthesis and of synthesis *à priori*. How are synthetical judgments *à priori* possible? is the question prefixed to the *Critick of Pure Reason*. This is the determining point in his philosophy by which its scope is bounded. The necessity of *à priori* synthesis to knowledge, and the necessity of his system of Pure Reason to *à priori* synthesis, are the principles upon which he proceeds. Now, if it can be shown that the presupposition, under which alone Kant conceived it possible that *à priori* synthesis could exist, effectually precludes the possibility of the knowledge in question being either synthetical or *à priori*, and if the same can be shown to be true of Kant's successors, then the way will have been prepared towards such a modification of the Kantian principle and of their

common presupposition as may render it really synthetical and really *à priori*.

Kant then tried to account for the possibility of *à priori* synthetical knowledge, and it remains to be shown that his method of doing so deprives such knowledge of its *à priori* and synthetical character. In the well-known passage in the Preface to the Second Edition of the *Critick of Pure Reason* Kant states the fundamental principle of his method. "It has hitherto been assumed," says he, "that our cognition must conform to the objects, but all attempts to extend our knowledge concerning them *à priori* by means of concepts have under this assumption failed. Let us try if we may not be more successful in the problems of metaphysics if we assume that the objects must conform to our cognition." In this passage is contained the germ not merely of Kant's philosophy but also of that of Fichte, Schelling and Hegel. Cognition can have *à priori* knowledge of the object because it is in itself to that extent the object which it knows. To that extent it makes the object and makes itself objective. But in the first place there cannot here be even cognition. If we confine ourselves carefully to the consideration merely of the *à priori* knowledge and the *à priori* object, it is evident that prior to the cognition there is no *à priori* object to be cognised since the cognition itself first constitutes that object, and a cognition which is the cognition of nothing is impossible, and therefore cannot exist to constitute an object of cognition. There is thus present in Kant's theory an element of pure tautology which, like every tautology, can have no beginning or end and simply vanishes in nothing. This tautology has, however, been faithfully preserved by Kant's successors. But even if we were to grant to Kant that the knowledge in question is knowledge, it certainly is not knowledge *à priori*. For if I only know that *à priori* of objects which I myself add to them in the act of knowing them, it is obvious that there is here no *à priori* knowledge whatever. Knowledge implies that it is a knowledge of something, and *à priori* knowledge implies that it is a knowledge of something prior to or independent of the experience of it. But independent of or apart from the experience in which it is given the object does not exist according to Kant, at least does not exist in regard to the elements in it which are the object of *à priori* knowledge. There is thus no object left in relation to which cognition may be *à priori*. At the very most we have only a cognition of a certain constitution of our faculties which enters into, conditions and forms phenomena. Cognition is thus supposed already to be at least in part the object which it was *à priori* to know. But the knowledge of this constitution is itself *à posteriori*. No matter how intellectual and truly *à priori* such knowledge may be in itself, Kant's theory of its origin renders it simply *à posteriori*, one may say mere matter of fact.

If *à priori* knowledge is really not recognised as that which it

is by Kant, still less is the synthesis involved in such knowledge explained by him. That is, it is assumed from the outset, not explained in its origin. Kant's problem was, How can we know a synthetical truth *à priori* and independent of experience? Kant's answer is, that the synthesis lies in the knowing, and that in the process of experience we think it into nature. Very good: when we thus think it into nature in experience we can certainly extract it again from our experience of nature; but the whole of this process is analytical. The real question is, Whence comes the synthesis in the first instance as it is in the intellect? How can a thought go out from beyond itself to the thought of something more than itself? How is the synthetic movement of thought to be accounted for? Kant only brings forward the synthesis in thought to explain the synthesis in fact, but the synthesis in itself either in thought or fact is unexplained. The same remarks apply to Kant's criteria of *à priori* knowledge, Necessity and Universality. However universal and necessary the knowledge in question may be, we repeat, Kant's theory of its origin makes it to be neither the one nor the other. In the first place the knowledge is not necessary. The judgments in which it is expressed are derived from the forms, categories and other elements which constitute for Kant the machinery of intellect, but that the machinery is so constituted is simply matter of fact. The only necessity involved is that of identity, *viz.*, that the facts and relations involved in this machinery be permanent, *i.e.*, the necessity of themselves being as they are when met in experience. Similarly with universality. Kant's *à priori* truths are not really universal, for they are only true of objects of experience. They do not apply to noumena. And the reason is, because only in objects of experience can the forms of sense and notions of the understanding make themselves good. His universality is merely the recurrence of the same relation involved in our mental structure. In other words, an *à priori* truth is in Kant only the same individual fact or relation in all cases and is in no true sense universal.

It may be said that the nerve of these criticisms resides in what has been long ago observed and overcome, in the fact that Kant's system is individualistic, rests apparently upon empirical psychology, that its component parts seem to be taken by observation from experience, that he has not deduced his categories from the act of thought but gathered them empirically from the forms of the proposition, that in short he was unacquainted with that dialectical movement of thought in itself which was discovered by Fichte and perfected by Hegel. Be it so. Let us see then what this dialectical movement is and what it can accomplish; whether it can give us synthesis and synthesis *à priori*; whether it can account for truths which shall be both universal and necessary.

Now, in the first place, it is to be observed that the objection

we have urged against Kant is valid also against the dialectical method. The dialectical process is not a process of cognition, nor indeed a possible process at all. There exists in it the same fatal tautology which we have already objected to as existing in Kant. The *à priori* object of cognition lies in the nature of cognition itself for Kant. Kant apparently avoids the tautology involved in a cognition which is thus act and object of the act in one, by postulating an *à posteriori* object in or along with the *à priori*. The *Ding-an-sich* acting upon our receptivity produces a sensuous manifold through which the faculty of knowledge is awakened into cognition and self-cognition, in that it cognises its own *à priori* nature in and with the objects of sense. The *Ding-an-sich* thus awakens cognition into exercise and differentiates its purely tautological relation to itself. But this mixing up of the matter of sense with the self-relation of cognition does not really avail Kant. The two ingredients are side by side like oil and water shaken together. And the peculiar weakness in the relation of cognition to itself as *à priori* element in the object is not in the least affected by the fact that the *à posteriori* given element is worked up through it. Is this difficulty removed in the dialectical process? Here the element of differentiation, the manifold, is not given from without, produced by the operation of a thing-in-itself, but is conceived as inherent in the nature of thought itself. But this does not alter the matter one whit, so long as the method of mechanical mixture is retained. And this is what the dialectical method does retain. It shows that one notion is not without the other, that it strikes round into its opposite, &c.; but in all this an intelligent mediation is altogether wanting. The validity of any notion consists in being the notion of something distinct from itself. To convert this intelligible relation, which lies in the nature of any and every thought, into a series of mechanical transformations with opposite thoughts, is what the dialectic of Hegel accomplishes.

In Hegel there are two things confounded, run together into one, which should be strictly held apart, *viz.*, the movement or synthesis in thought and the movement or synthesis in the object of thought. With all his struggles after a more living unity he never freed himself from the prejudice of the *Identitätsphilosophie* that the agreement between these two sides must be one of Identity. But seeing that the element of Difference was just as essentially present as that of Identity, he conceived the identity in question as the identity of a movement capable of giving birth to this as well as all other differences. But a movement which is identical through the differences is just as little capable of giving birth to the differences through which it is, as is the most rigid and motionless identity. Therefore, even if we concede to Hegel that his method gives an adequate representation of the synthetical movement of thought (and it lies in the very nature of thought to involve synthesis), it does not by any means follow

that the movement itself is thereby accounted for. On the contrary, by trying to represent this movement as *self-movement* he falls back into the analytic groove out of which Kant professed to bring Philosophy. That Kant himself did not succeed in what he aimed at, it was comparatively easy to show. He assumed beforehand his categories and their syntheses as existing ready to hand in the constitution of the understanding and waiting only for sensation to awaken them into activity, as plainly and openly as did ever the dogmatic philosophers the nature and properties of things-in-themselves, when once sensation had made us aware of their existence. The only difference is that the synthesis which the dogmatists assumed as existing without, Kant assumed as existing within; and the influence exerted on experience is regarded in the one case as coming from an external, in the other from an internal source. Synthesis, as synthetical movement of thought, can here be scarcely said to exist. But in Hegel it does exist, and correctly enough too, as thinking that through which itself is. The question is—Is that through which the movement of thought is, something distinct from this movement and given independently of it, or is it merely the result of the movement itself?

According to Hegel the forward movement of thought in philosophy is quite as much a going backwards, a return into the ground from which that wherewith the beginning was made depends, and by which it is in fact produced. This statement of Hegel arises from his confusion of the order of knowledge with the order of reality and his failure to perceive that the former is only through the latter as distinct from itself. But making allowance for this we may admit a certain correctness in the Hegelian method. The principle of the method points out not what that which we think about or seek to discover must be like, but what our thinking about it must be like in order to be science. It points out the relation in which our completed knowledge must stand to the knowledge with which we began. But this relation does not exist simply through itself. It exists only through a relation of objectivity which it implicates as the condition of its own possibility as knowledge. It is because the movement of thought thus for its own existence requires that to be through which it itself is and in the cognition of which it consists, that it has been represented as the condition and source of the objective being which it cognises, and in ontology or metaphysics as the creator of the very things which it is said to be the instrument afterwards of investigating. But the movement of thought is not in itself the source of its own movement. Thought has its being as much out of as within itself, and to suppose that it is otherwise is the great defect of the dialectical method. To Hegel the movement of the "Begriff" is the movement "der Sache selbst". But that is just what it is not, though it is a movement which is only through a correlative objective relativity. The movement of



thought is always through an objective relation which it understands and in understanding which it is. To confound this objective relation with the movement of thought itself is the rock on which Hegel splits.

These remarks are sufficient to indicate the point of view from which we would wish to raise again the problem of Kant: How are synthetical judgments *à priori* possible? Is it really true that it is possible to explain synthesis *à priori* only if we assume that the object must conform to our cognition, or is created by thought, whether that thought be itself subjective, objective, or absolute? Now, it is the result of our foregoing criticism that the synthesis in thought has itself meaning only as the thinking of an objective synthesis, a synthesis in the object. It cannot therefore itself create that synthesis upon which its own essence and possibility depend. On the other hand, it is impossible to accept any psychological genesis of the intellectual synthesis, the synthesis in thought, from the objective synthesis, not merely because such genesis must always presuppose what it seeks to explain, but also because the objective synthesis has reality and meaning for intelligence, is in fact anything whatever only in relation to the correlative thought of itself by which its own intelligible being is conditioned. These two sides are thus co-ordinate. How then is their harmony possible? Now, if these two sides are conceived as independent, existing separately from each other, then their harmony must be pre-established. If we conceive them as not independent, but as having their being in each other, if we conceive thought and thing as springing into existence in immediate and mediate relation and correlation with each other, then the need for such a pre-established harmony ceases. The harmony is not artificial but natural and immanent.

Towards such a modification of the Kantian principle much has been done to clear the way. In this respect to Materialism and Idealism a debt of gratitude is equally due. The successors of Kant in Germany have set the Kantian philosophy free from the trammels of mere subjective Idealism, and have reduced its principle to its finest expression. The study of their systems is mainly useful to give us the clearest consciousness of the extent of the problem which Kant attempted to solve within the narrow limits of the individual mind. Those great half-truths that there is Reason in the world, that the world is essentially Thought, have an important meaning. It is true if we look these statements in the face they are downright nonsense. Reason is not in the world and also in consciousness, just like a stick here in the water and there out of it. What is in the world is not Reason itself but that through which Reason is Reason, an order of fact correlative to the inner order of thought. In like manner it is true that the world is thought, and the things in it thoughts, but these thoughts are the thoughts of something more than thoughts; they are the thoughts of realities, and the essence of things is not by any means exhausted or even affected by the thoughts of them.

Nevertheless, we ought by no means to underestimate the value of the contributions of Fichte, Schelling, and Hegel. It is probable that in Kant there is by far the greatest supply of material for philosophical thought, that his system is the most intrinsically valuable, but the general plan and extent of the building can only be learned from the former. And in this sense, and from this point of view we ought to go back to Kant. Kant has indeed been lately studied amongst us as introductory to Hegel. But if there is truth in what we have urged in the foregoing it would be better to reverse this procedure and to study Fichte, Schelling and Hegel, not in order to accept their conclusions as final results of philosophical speculation, but in order to turn over once more all that is implied in Kant's method of answering the question—How are *à priori* synthetical judgments possible?

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### ABSOLUTISM AND EMPIRICISM.

By Prof. WILLIAM JAMES.

No seeker of truth can fail to rejoice at the *terre-à-terre* sort of discussion of the issues between Empiricism and Transcendentalism (or, as the champions of the latter would probably prefer to say, between Irrationalism and Rationalism) that seems to have begun in MIND. It would seem as if, over concrete examples like Mr. J. S. Haldane's, both parties ought inevitably to come to a better understanding. As a reader with a strong bias towards Irrationalism, I have studied his article in No. XXXIII. with the liveliest admiration of its temper and its painstaking effort to be clear. But the cases discussed failed to satisfy me, and I was at first tempted to write a Note animadverting upon them in detail. The growth of the limb, the sea's contour, the vicarious functioning of the nerve-centre, the digitalis curing the heart, are unfortunately *not* cases where we can *see any through-and-through* conditioning of the parts by the whole. They are all cases of reciprocity where subjects, supposed independently to exist, acquire certain attributes through their relations to other subjects. That they also *exist* through similar relations is only an ideal supposition, not verified to our understanding in these or any other concrete cases whatsoever.

If, however, one were to urge this solemnly, Mr. Haldane's friends could easily reply that he only gave us such examples on account of the hardness of our hearts. He knew full well their imperfection, but he hoped that to those who would not spontaneously ascend to the Notion of the Totality, these cases might prove a spur and suggest and symbolise something better than themselves. No particular case that can be brought forward is a real concrete. They are all abstractions from the Whole,

and of course the "through-and-through" character cannot be found in them. Each of them still contains among its elements what we call *things*, grammatical subjects, forming a sort of residual *caput mortuum* of Existence after all the relations that figure in the examples, have been told off. On this "existence," thinks popular philosophy, things may live on, like the winter bears on their own fat, never entering relations at all or, if entering them, entering an entirely different set of them from those treated of in Mr. Haldane's examples. Thus *if* the digitalis were to weaken instead of strengthening the heart, and to produce death (as sometimes happens), it would determine itself, through determining the organism, to the function of "kill" instead of that of "cure". The function and relation seem adventitious, depending on what kind of a heart the digitalis gets hold of, the digitalis and the heart being facts external and, so to speak, accidental to each other. But this popular view, Mr. Haldane's friends will continue, is an illusion. What seems to us the "existence" of digitalis and heart outside of the relations of killing or curing, is but a function in a wider system of relations, of which, *pro hac vice*, we take no account. The larger system determines the *existence* just as absolutely as the system "kill," or the system "cure," determined the *function* of the digitalis. Ascend to the absolute system, instead of biding with these relative and partial ones, and you shall see that the law of through-and-throughness must and does obtain.

Of course, this argument is entirely reasonable, and debars us completely from chopping logic about the concrete examples Mr. Haldane has chosen. It is not his fault if his categories are so fine an instrument that nothing but the sum total of things can be taken to show us the manner of their use. It is simply our misfortune that he has not the sum total of things to show it by. Let us fall back from all concrete attempts and see what we can do with his notion of through-and-throughness, avowedly taken *in abstracto*. In abstract systems the "through-and-through" Ideal is realised on every hand. In any system, as such, the members are only *members* in the system. Abolish the system and you abolish its members, for you have conceived them through no other property than the abstract one of membership. Neither rightness nor leftness, except through bi-laterality. Neither mortgager nor mortgagee, except through mortgage. The logic of all these cases is this :—*If* A, then B ; but *if* B, then A : wherefore *if* either, Both ; and if not Both, Nothing.

It costs nothing, not even a mental effort, to admit that the absolute totality of things *may* be organised exactly after the pattern of one of these "through-and-through" abstractions. In fact, it is the pleasantest and freest of mental movements. Husband makes, and is made by, wife, through marriage ; one makes other, by being itself other ; everything self-created through its opposite—you go round like a squirrel in a cage. But if you

stop and reflect upon what you are about, you lay bare the exact point at issue between common-sense and the "through-and-through" school.

What, in fact, is the logic of these abstract systems? It is, as we said above: If any Member, then the Whole System; if not the Whole System, then Nothing. But how can Logic possibly do anything more with these two hypotheses than combine them into the single disjunctive proposition—"Either this Whole System, just as it stands, or Nothing at all". Is not that disjunction the ultimate word of Logic in the matter, and can any disjunction, as such, resolve *itself*? It may be that Mr. Haldane sees how one horn, the concept of the Whole System, carries real existence with it. But if he has been as unsuccessful as I in assimilating the Hegelian re-editings of the Anselmian proof, he will have to say that though Logic may determine *what* the system must be, *if* it is, something else than Logic must tell us *that* it is. Mr. Haldane in this case would probably consciously, or unconsciously, make an appeal to Fact: the disjunction *is* decided, since nobody can dispute that now, as a matter of fact, *something*, and not nothing, *is*. We must *therefore*, he would probably say, go on to admit the Whole System in the desiderated sense. Is not then the validity of the Anselmian proof the nucleus of the whole question between Logic and Fact? Ought not the efforts of Mr. Haldane and his friends to be principally devoted to its elucidation? Is it not the real door of separation between Empiricism and Rationalism? And if the Rationalists leave that door for a moment off its hinges, can any power keep that abstract, opaque, unmediated, external, irrational, and irresponsible monster, known to the vulgar as bare Fact, from getting in and contaminating the whole sanctuary with his presence? Can anything prevent Faust from changing "Am Anfang war das Wort" into "Am Anfang war die That"?

Nothing in earth or heaven. Only the Anselmian proof can keep Fact out of philosophy. The question, "Shall Fact be recognised as an ultimate principle?" is the whole issue between the Rationalists and the Empiricism of vulgar thought.

Of course, if so recognised, Fact sets a limit to the "through-and-through" character of the world's rationality. That rationality might then mediate between all the members of our conception of the world, but not between the conception itself and reality. Reality would have to be given, not by Reason, but by Fact. Fact holds out blankly, brutally and blindly, against that universal deliquescence of everything into logical relations which the Absolutist Logic demands, and it is the only thing that does hold out. Hence the ire of the Absolutist Logic—hence its non-recognition, its 'cutting' of Fact.

The reasons it gives for the 'cutting' are that Fact is speechless, a mere word for the negation of thought, a vacuous unknowability,

a dog-in-the-manger, in truth, which, having no rights of its own, can find nothing else to do than to keep its betters out of theirs.

There are two points involved here : first the claim that certain things have rights that are absolute, ubiquitous and all pervasive, and in regard to which nothing else can possibly exist in its *own* right ; and second that anything that denies *this* assertion is *pure* negativity with no positive context whatsoever.

Take the latter point first. Is it true that what is negative in one way is thereby convicted of incapacity to be positive in any other way? The word "Fact" is like the word "Accident," like the word "Absolute" itself. They all have their negative connotation. In truth their whole connotation is negative and relative. All it says is that, whatever the thing may be that is denoted by the words, *other* things do not control it. Where fact, where accident is, they must be silent, it alone can speak. But that does not prevent its speaking as loudly as you please, in its own tongue. It may have an inward life, self-transparent and active in the maximum degree. An indeterminate future volition on my part, for example, would be a strict accident as far as my present self is concerned. But that could not prevent it, *in the moment in which it occurred*, from being possibly the most intensely living and luminous experience I ever had. Its quality of being a brute fact *ab extra* says nothing whatever as to its inwardness. It simply says to *outsiders* : 'Hands off!'

And this brings us back to the first point of the Absolutist indictment of Fact. Is that point really anything more than a fantastic dislike to letting *anything* say 'Hands off'? What else explains the contempt the Absolutist authors exhibit for a freedom defined simply on its "negative" side, as freedom "from," &c.? What else prompts them to deride such freedom? But, dislike for dislike, who shall decide? Why is not their dislike at having me "from" them, entirely on a par with mine at having them "through" me?

I know very well that in talking of dislikes to those who never mention them, I am doing a very coarse thing, and making a sort of intellectual Orson of myself. But, for the life of me, I cannot help it, because I feel sure that likes and dislikes *must* be among the ultimate factors of their philosophy as well as of mine. Would they but admit it! How sweetly we then could hold converse together! There is *something* finite about us both, as we now stand. We do not know the Absolute Whole *yet*. Part of it is still negative to us. Among the *whats* of it still stalks a mob of opaque *thats*, without which we cannot think. But just as I admit that this is all possibly provisional, that even the Anselmian proof may come out all right, and creation *may* be a rational system through-and-through, why might they not also admit that it may all be otherwise, and that the shadow, the opacity, the negativity, the "from"-ness, the plurality that is ultimate, *may* never be wholly driven from the scene. We should

both then be avowedly making hypotheses, playing with Ideals. Ah! Why is the notion of hypothesis so abhorrent to the Hegelian mind?

And once down on our common level of hypothesis, we might then admit scepticism, since the Whole is not yet revealed, to be the soundest *logical* position. But since we are in the main not sceptics, we might go on and frankly confess to each other the motives for our several faiths. I frankly confess mine—I cannot but think that at bottom they are of an æsthetic and not of a logical sort. The “through-and-through” universe seems to suffocate me with its infallible impeccable all-pervasiveness. Its necessity, with no possibilities; its relations, with no subjects, make me feel as if I had entered into a contract with no reserved rights, or rather as if I had to live in a large seaside boarding-house with no private bed-room in which I might take refuge from the society of the place. I am distinctly aware, moreover, that the old quarrel of sinner and pharisee has something to do with the matter. Certainly, to my personal knowledge, all Hegelians are not prigs, but I somehow feel as if all prigs ought to end, if developed, by becoming Hegelians. There is a story of two clergymen asked by mistake to conduct the same funeral. One came first and had got no farther than “I am the Resurrection and the Life,” when the other entered. “I am the Resurrection and the Life,” cried the latter. The “through-and-through” philosophy, as it actually exists, reminds many of us of that clergyman. It seems too buttoned-up and white-chokered and clean-shaven a thing to speak for the vast slow-breathing unconscious Kosmos with its dread abysses and its unknown tides. The “freedom” we want to see there is not the freedom, with a string tied to its leg and warranted not to fly away, of that philosophy. “Let it fly away,” we say, “from us! What then?”

Again I know I am exhibiting my mental grossness. But again, *Ich kann nicht anders*. I show my feelings; why *will* they not show theirs? I know they *have* a personal feeling about the through-and-through universe, which is entirely different from mine, and which I should very likely be much the better for gaining if they would only show me how. Their persistence in telling me that feeling has nothing to do with the question, that it is a pure matter of absolute reason, keeps me for ever out of the pale. Still seeing a *that* in things which Logic does not expel, the most I can do is to *aspire* to the expulsion. At present I do not even aspire. Aspiration is a feeling. What can kindle feeling but the example of feeling? And if the Hegelians *will* refuse to set an example, what can they expect the rest of us to do? To speak more seriously, the one *fundamental* quarrel Empiricism has with Absolutism is over this repudiation by Absolutism of the personal and æsthetic factor in the construction of philosophy. That we all of us have feelings, Empiricism feels quite sure. That they

may be as prophetic and anticipatory of truth as anything else we have, and some of them more so than others, cannot possibly be denied. But what hope is there of squaring and settling opinions unless Absolutism will hold parley on this common ground ; and will admit that all philosophies are hypotheses, to which all our faculties, emotional as well as logical, help us, and the truest of which will at the final integration of things be found in possession of the men whose faculties on the whole had the best divining power ?

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### CAN A MAN SIN AGAINST KNOWLEDGE ?

By F. H. BRADLEY.

There is an old paradox which at some time we must all have encountered. That no one sins willingly, and that vice is ignorance, must at some time have been offered to us all as gospel. And most of us, I presume, have long ago concluded that a truth has here been pressed into a falsehood. We naturally reflect that, as for the artist beauty rules the universe and is the dominant reality, so for the reasoning philosopher reason is the king and master both of the world and of the soul. And we have persuaded ourselves that such prepossessions lead to conflict with fact. For not only may the ruler at times be absent, but even if he is present, yet appetite defies him, and, with no cloak of ignorance, sins wilfully and knowingly in the master's sight.

I cannot think that our persuasion is false. For me, too, the old gospel has joined the museum of one-sided growths, and, with "the practical reason," has been placed on the shelf of interesting illusions. I would not seek to revive them ; but, on the contrary, my object is to remove a hindrance to their well-earned repose. There is a psychological doubt which remains unsatisfied, and serves as the foundation for a serious mistake. Our experiences seem discrepant. For myself, and in my own mind, I am able to verify the presence of wrong-doing in the face of and despite the voice of conscience. I feel sure of this fact, but others are not certain, while others again within their experience are certain of the opposite. They assure me that never until conscience has slumbered, never until for the moment they have forgotten the quality of their act, are they able to give way to an immoral impulse.

It is not likely that any of us are quite mistaken about the fact. When an observer tells us that with him bad action never co-exists with present knowledge, that an actual consciousness of its immorality is incompatible with the victory of any desire, we may be sure that he is not wholly in error. He has observed a fact, but observed it wrongly ; and our task is to show that his



mistake has come from a view that is partial, and an interpretation that is erroneous.

Perhaps the most convenient way of pointing out the root of the error will be for me to invent a defence, which will show what I think is the source of delusion. And if I dwell upon truths which we all understand, I may excuse myself by observing that, if all of us understand them, nearly all of us make mistakes because we disregard them.

What defence can we find for the doctrine that knowledge excludes wrong action? We are not forced to invoke the obsolete primacy of the "practical reason": we may move to the ground of a saner psychology and may rest upon fact. For we may urge, 'No one knows an act to be wrong unless he has an idea of the wrongness. But if this be admitted, observe what follows: the *idea* of wrong implies the *feeling* of wrong. And this consequence is certain; for our ideas, we know, are representative signs, and to perceive the signification without the presence of the whole sign is quite impossible. Thus when you have in your mind the idea of a horse or a cow or a bad action, you possess a present image, part of which you neglect, and part of which you take as your meaning, and use as the idea of something not present but represented. But now what is it that could represent a horse but something present in the form of a horse-image? And what is it again that could be the idea of a moral or of an immoral act, unless it were something present to the mind in one of these qualities? But to be present to the mind as moral or immoral implies a feeling of right or wrong. What represents, and is used as the idea of the act, must therefore imply a corresponding emotional element. If so, however, the conclusion seems proved; for since what represents right or wrong is emotional, it therefore, because it is emotional, will work. It will not indeed work as the idea of something else, but it will work as the actual present state. It will be the badness that is *felt*, and not the badness that is *thought*, which will have power to move us. In other words, it is the whole sign that is active, and not the mere signification. But this will make no difference. Since you cannot represent the wrong that is signified without the present image which is felt as wrong, the knowledge of vice must thus be *per accidens* a dislike to viciousness, and this felt aversion, psychologically implied in all ideas of immorality, will fetter the will, until, with the knowledge, the feeling disappears.

'And we may support this defence by an appeal to the general theory of motives. A motive, if that means the *object* of our desire or aversion, must be the idea of something pleasant or painful. And thus (I have argued in my *Ethical Studies*), if the motive is the end and is so an idea, then what moves is never the motive as such. But on the other hand the motive will move *per accidens*. For an idea implies a representative state of mind, and that state of mind must have present existence as a psychical phenomenon.

The state which represents something pleasant or painful must furthermore itself *be* pleasant or painful. The idea will thus indirectly imply a feeling, and in this indirect way a motive will move.

'And by this we may not only support our paradox, but may prop up, besides, another doctrine. To suppose that what promises to be most pleasant must always move us, we know is a mistake, because the promised is an idea, while the mover is feeling. But, since the future prospect of the most pleasant could not be represented to us in idea, unless there were a feeling which served as the sign, hence, through this feeling and *per accidens*, the promise will move, and, *per accidens* again, the promise of the most pleasant will move us the most.'

Such is the defence which we may place in the mouth of our failing paradox, and this defence, though erroneous, still is based on a solid foundation. The reader may refuse to follow us through these psychological subtleties, but I am sure that any one who is not at home in them is threatened by errors from every side.

The defence we have put forward amounts to this : an idea not only represents something else beside itself, but is in itself an existing phenomenon, and in this capacity does psychological work. And hence the idea of immorality will be felt as an actual painful fact, and so will repel ; while, again, the idea of the greatest pleasure will be felt as most pleasant, and so must attract.

The mistake that is made here is tolerably simple. It is true that the idea of a pleasure or a wrong act must imply a feeling, and that this feeling will do *some* work. But it is not true that the feeling need determine the will to avoid or pursue the object of the idea. This is perfectly obvious, and our experience of the contest of discrepant impulses puts it beyond doubt. What is felt pleasant or painful will determine us or not, according as it stands to our whole state of desire. We need ask no hard questions about the nature of desire, but may state the matter thus. Admitting that pleasure and pain are what move us, it is still not mere pleasure nor again mere pain that determines the movement. It is the greatest felt pleasure, or the balance of pleasure or pain, that will succeed. And hence obviously, when we ask if a feeling will *work*, the question is a question of that feeling's intensity, and a question of its *comparative* intensity.

We shall agree, I hope, that the above is obvious ; but it gives us a key to the puzzle before us. When an observer maintains that he cannot act against a wakeful conscience, what happens in his mind, I think, is this. He has fixed his attention upon the wrongful quality of the act, and that fixing of the attention has important results. In the first place it is exclusive ; that is, it keeps out *other* ideas, and so removes the conflicting influence of *their* feelings. In the second place (I do not ask how these two functions are connected) the attention strengthens ; that is,

through attention the idea becomes clearer, and the images and feelings involved in that idea become also stronger; so that to resist such an isolated and heightened prompting is now impossible. Hence, if our observer were to say, 'When I realise with vividness the immorality of my act, I cannot, while I do so, go on to commit it,' I think that his statement would be quite correct. It would be in accordance both with sound psychology and with the evidence of fact.

But such a modified statement would fail to carry the required conclusion. It would not show that, when my conscience is aroused, I am unable then to oppose it and defeat it. For, in the first place, when we have before us the idea of a bad act, our attention need not be concentrated upon this one element of our whole state of mind. On the contrary, we may try to observe indifferently all the discordant factors of our complex condition; and, if we do this, our idea of the immorality of the act will not gain any *relative* increase of strength. And again, and in the second place, there is a very great difference between ideas. Some are highly *symbolic*, and in this case their effect on the imagination and feelings is comparatively weak.

I will try to explain this second point. Suppose, for example, I have thought of something pleasant, and then am asked to think of something *twice* as pleasant. I am able to perform this in more ways than one. I may retain the pleasant image which I already have, and which has furnished me with my idea of the represented pleasure; I may increase the pleasantness of that pleasant image, and may use this increase as a sign of something that is twice as pleasant. In this case we might roughly and inaccurately say that what *represents* twice the pleasure is itself actually felt to be doubly pleasant. But I may take another course: I need not try to double my pleasant image, but may qualify it from outside by another and a foreign image of quantity. That is, I may call up an image of something *not* pleasant, which is increased twofold, and I may use this as a sign to stand for *twice*; and adding this from the outside to my idea of something pleasant, I may so indirectly acquire the idea of what is doubly pleasant. In this case I do not say that the effect on the feelings and on the imagination will vanish wholly, but I am sure we shall agree that it will be much diminished.

The point is so important that I perhaps may be allowed another illustration. I have the image of a horse before my mind, and I want to think of a hundred horses. Now, to do this, I need not try to have before me a hundred horse-images, but may apply the idea of a hundred from elsewhere. No doubt, this idea of a hundred times must rest upon *some* present image, but there is no sort of reason why it should rest on the obscure image of a hundred horses. In the same way, if I desire to think of a horse one hundred times as large as the first, I need not struggle to magnify my present horse-image. I may employ some *other*

obscure image, take from that the idea of hundredfoldness, and employ this to modify my idea of a horse.

And we may strengthen our position by a familiar experience. We all know that as a rule it is impossible to recall either vivid pleasures or vivid pains. But it would be wrong to say that I have not the knowledge that my pleasure or my pain was very great. I do know this; but I know it discursively and by the intellectual addition of the idea of intensity to my idea of the feeling. And hence the effect on the imagination and emotions may be very weak; it may serve in temptation but to sour the pleasure without preventing the sin. In a corrupted state, where the passions are enfeebled and where cruel experience has opened the eyes without changing the heart, we may find the condition described by Lamb, "the sin and the suffering co-instantaneous, or the latter forerunning the former, remorse preceding action".

The result of this is that the idea of a greater pleasure need not in itself be felt as more pleasant, nor the idea of a greater pain as more painful. The increase of feeling, if it takes place at all, need take place in no proportion to the increase thought of. This again must be true of the idea of wrong-doing. I may qualify my idea of a certain act by the addition of immorality, but I may transfer that addition from another and wholly separate image. In this case my knowledge that an act is bad does not rest on an image of the act as bad. It consists primarily in the intellectual use of a symbol, and the secondary effect on the imagination and the feelings may be almost inappreciable.

Our ethical paradox, if true at all, will be true only of a mind which is confined to intuition; and such a mind is not known to exist, except at an *early* stage of evolution. But any mind which can abstract and reflect and reason discursively will be able to think of an act as being wrong, and yet the feeling of that act's wrongness may not pass beyond an ineffective minimum. It is only where the attention is concentrated upon the quality of the act, and even then it is only where the act in its wrongful quality is present as a vivid imagination, that the conscience will be irresistible. It is not knowledge, it is a relative degree of feeling excited by a certain kind of knowledge, that coerces the appetite.

This, I think, will furnish us with a partial justification of our paradox, and it also may serve as its final refutation.

## VII.—CRITICAL NOTICES.

*Mental Evolution in Animals.* By GEORGE JOHN ROMANES, M.A., LL.D., F.R.S., Zoological Secretary of the Linnean Society. With a Posthumous Essay on Instinct by CHARLES DARWIN. London: Kegan Paul, Trench, 1883. Pp. 411.

This book is probably the first attempt to treat the psychology of animals systematically and as a whole. It is based on the theory of evolution, without which, indeed, such an investigation would scarcely have been possible. To the materials contained in the author's previous work on *Animal Intelligence* much has been added in the present volume. In the chapters on Instinct especially, new accounts are to be found of observations made or collected by the author. The chapter on "The Structure and Functions of Nerve-Tissue" contains an account of the results of his important researches on the nervous systems of the Medusæ. These researches seem to him to confirm Mr. Spencer's theory of the origin of nerve-fibres but not of nerve-cells, which he infers to be not, as Mr. Spencer argues, the result of the confluence of fibres, but of the further specialisation of cells that have already become specialised as epithelial or epidermal cells. In the chapter on "Sensation" he gives the evidences of the view now generally taken by biologists that the organs of special sense arise as modified parts of the epidermis. He agrees with Mr. Spencer in concluding that the senses are all "differentiations of the general sense of touch".

Some of the facts that are found at the beginning of the chapter on Sensation point to the conclusion, which was also suggested by the facts given in the earlier chapters of *Animal Intelligence*, but which is nowhere drawn by the author, that the lowest animals, although they have no organs of special sense, but only, so far as can be made out, a general sensibility resident in their protoplasm, have the beginnings not only of sensibility but also of will and intelligence. The only difficulty of admitting this seems to be that animals higher in the zoological scale would have to be placed lower in the psychological scale. And this difficulty is apparent rather than real. For in all morphological classifications parasitic animals and plants form anomalous groups. Now animals that have lost the plasticity characteristic of Protozoa, and whose nervous systems are occupied chiefly in reflex actions, might be regarded as psychologically degenerate, just as parasites and some non-parasitic animals are degenerate morphologically.

The definition of Instinct given in *Animal Intelligence* is repeated in the present work. Instinct is defined as "reflex action into which there is imported the element of consciousness" (p. 159).

This is now explained to mean that, while "a stimulus which evokes a reflex action is at most a sensation," on the other hand "a stimulus which evokes an instinctive action is a perception". It might be expected from this that Dr. Romanes would agree with Lewes in speaking of unconscious sensations. But he refers to Lewes's definition of a sensation, as simply the reaction of a sense-organ, only to reject it, and goes on to say that "the difficulty of determining whether or not this or that particular low form of life has the beginnings of Sensation is one and the same as the question whether it has the beginnings of Consciousness" (p. 79). According to this statement, wherever there is sensation there is consciousness; and from this it seems to follow that some reflex actions—that is to say, those which are excited by sensations—are accompanied by consciousness. But, according to the definition, these are instincts. Instinct, therefore, by the definition (as it is now interpreted), seems indistinguishable from reflex action.

The constructive and psychological part of the present volume is less successful than the part that serves as a supplement to *Animal Intelligence*. Apart from all differences of opinion on purely philosophical questions,—which the author desires to avoid,—the treatment of the fundamental question of the relation of Mind and Body can hardly be described as satisfactory. It is quite possible, without implying any metaphysical doctrine, to regard mental and physical changes always as concomitants, never as causes and effects of one another. In some places Dr. Romanes seems to be unwilling to take up this position for fear of committing himself to some definite system of metaphysics. In the following passage his words imply that its evidence is that of a directly observed fact.

"We know by immediate or subjective analysis that consciousness only occurs when a nerve-centre is engaged in such a focussing of vivid or comparatively unusual stimuli as have been described, and when as a preliminary to this focussing or act of discriminative adjustment there arises in the nerve-centre a comparative turmoil of stimuli coursing in more or less unaccustomed directions, and therefore giving rise to a comparative delay in the occurrence of the eventual response. But we are totally in the dark as to the causal connexion, if any, between such a state of turmoil in the ganglion and the occurrence of consciousness" (p. 75).

Notwithstanding the statement in the last sentence, Dr. Romanes sometimes appears to think that the occurrence of consciousness is somehow explained if it can be shown to arise when there is an increase in the time taken up by the transmission of a stimulus. "Consciousness," he says, "is but an adjunct which arises when the physical processes—owing to infrequency of repetition, complexity of operation, or other causes—involve what I have before called ganglionic friction" (p. 113). When the nerve-centre has become "a seat of comparative turmoil among molecular forces" it "begins to become conscious of its own work-

ing" (p. 319). Not only is this attempt made to explain consciousness from the objective side, but an attempt is also made to show how mental states may become factors of physical changes.

"Possibly, however—and as a mere matter of speculation, the possibility is worth stating—in whatever way the inconceivable connexion between Body and Mind came to be established, the primary cause of its establishment, or of the dawn of subjectivity, may have been this very need of inducing organisms to avoid the deleterious, and to seek the beneficial; the *raison d'être* of Consciousness may have been that of supplying the condition to the feeling of Pleasure and Pain. Be this as it may, however, it seems certain, as a matter of observable fact, that the association of Pleasure and Pain with organic states and processes which are respectively beneficial and deleterious to the organism, is the most important function of Consciousness in the scheme of Evolution" (pp. 110-111).

It is difficult to infer anything from this passage except that the objective factors of the process of evolution have the power of introducing subjective factors among themselves, which in turn act upon the objective factors and change the course of events. And in other places purely physical processes are spoken of as "the raw material of consciousness". Perhaps the inconsistency in all this is only verbal; and it must be admitted that in many passages the expressions as to the relation of Mind and Body are not open to objection. But the opposition between subject and object might have been stated with more clearness and maintained with more consistency.

The selection of "the criterion of mind" is the starting-point of the investigation. The evidence of Choice having been taken as a criterion by which "the upper limit of non-mental action" may be determined, it is decided that "the physiological aspect of choice" is "the power of discriminating between stimuli, irrespective of their relative mechanical intensities". This power and "the complementary power of adaptive response" are "the root-principles of mind". There is a correlation such as might be expected *a priori* "between muscular and mental evolution—or, more generally, between power of discrimination and variety of adaptive movements".

"Thus, if we again take mental operations as indices whereby to study the more refined working of nervous centres, as we take muscular movements to be so many indices, 'writ large,' of the less refined working of such centres, we again find forced upon us the truth that the method of nervous evolution has everywhere been uniform; it has everywhere consisted in a progressive development of the power of discriminating between stimuli, combined with the complementary power of adaptive response" (p. 62).

The development of mind is figured in the diagram placed at the beginning of the book by a tree-like structure having its stem assigned to Will, and a system of branches on each side to Emotion and Intellect respectively. 'Volition' is represented as continuous with 'Reflex Action,' which is itself continuous with



'Neurility'. 'Neurility' is formed by the confluence of 'Discrimination' and 'Conductility,' which have their root in 'Excitability'. On the side of Intellect, from a branch representing 'Sensation' (which springs from the stem) a branch representing 'Perception' is given off; from 'Perception,' 'Imagination' is represented as originating; from 'Imagination,' 'Abstraction'. On the side of Emotion, a branch representing 'Preservation of Self' and 'of Species' springs from the stem and gives off a branch the lower part of which represents the beginning of 'Social Emotion'. The names of groups of animals are placed in a column that stands for 'the Psychological Scale'. Opposite these names in two other columns we find the 'Products of Intellectual Development' and 'Products of Emotional Development' characteristic of each group of animals. The levels drawn across the diagram at equal intervals are intended to represent degrees of elaboration of faculty.

The author points out the sufficiently obvious defects of such a diagram—that it does not adequately express the transitions that there are in nature from one stage of intelligence to another, and that the division of mind into "faculties" is essentially artificial. But there is another defect which he has not pointed out. The development of mind is represented as proceeding only in a single line. For the branching structure can only represent the division of a single mind at each of its stages into faculties, not the divergence of different types of mind. Nothing is said as to the possibility that at the same level of general intelligence there may be essentially different mental types,—dependent, for example, on different degrees of acuteness of the senses, and different ratios of their degrees of acuteness to one another. For anything the diagram tells us—and the same thing may be said of the whole book—there might be no differences between minds except differences of position in serial order. But if minds have been evolved, we should expect them to fall into groups having the peculiarities pointed out by Darwin as characteristic of all groups that have originated by evolution. And the evolution of existing types of animal intelligence, as well as of existing types of animal organisation, ought to be shown by a genealogical tree, not by a structure that cannot represent the growth of more than one type, either of mind or of organisation. If the construction of such a genealogical tree is at present impossible, it might at least have been pointed to as the ideal of a science of comparative psychology.

The definitions of the "faculties" are not quite so clear as is to be desired. This is perhaps comparatively unimportant; for it might be maintained that the distinctions expressed by the terms Sensation, Perception, Imagination, Abstraction, &c., have to such an extent become part of common thought that they may be applied with at least approximate accuracy by a good observer without the aid of strict definitions. But the more special terms that are

written above one another to express the exact degree of intelligence at which various classes of animals have arrived are sometimes the names of processes that are common to a large number of particular mental acts (as 'Memory,' 'Association by Contiguity,' 'Association by Similarity,' 'Reason'), sometimes names of special acts or of concrete products of mental activity (as 'Recognition of Offspring,' 'Dreaming,' 'Understanding of Mechanisms'). This mixture of terminologies having different values is a little incongruous. The scale of emotional development seems to have been drawn up without any attempt at a preliminary analysis of the emotions, and is so far more consistent than the scale of intellectual development, which is the result of a compromise. 'Pleasures and Pains' seem out of place among 'Products of Intellectual Development'. And although in the chapter on Emotion Dr. Romanes says that the emotions are represented as originating at the same time as perception because "as soon as an animal or a young child is able to perceive its sensations, it must be able to perceive pleasures and pains," no use is made, in his discussion of the emotions, of the theory of pleasure and pain adopted by him from Mr. Spencer and Mr. Grant Allen.

It is in his detailed treatment of Instinct, extending to eight chapters (pp. 159-317), that the author makes the most decided advance. Other writers have for the most part treated some one factor in the formation of Instinct in isolation from the rest. Dr. Romanes has brought together the ideas of "Primary Instincts" that originate by natural selection, and of "Secondary Instincts" that are the result of the transmission of organised habits. He has explained how the two processes by which instincts have been formed may influence one another, and how intelligence may modify instincts formed by each process and by the combination of both. These ideas are developed with great elaboration. All the positions that are taken up as to the existence of the simple processes, as to the compounding of factors, and as to the transmission by heredity of modifications of instinct are established by evidence. A good view of the general result of this investigation is given by the diagram placed opposite p. 265.

The posthumous Essay by Darwin printed as an Appendix is chiefly a collection of facts bearing on the theory of Instinct; and other notes made by the great naturalist are used by Dr. Romanes in his own treatment of the subject. No completed theory is to be found in the Essay; but it will have some interest for those who may wish to study in an earlier stage thoughts that are fully worked out in the eighth chapter of the *Origin of Species*.

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THOMAS WHITTAKER.

*Fallacies* : A View of Logic from the Practical Side. By ALFRED SIDGWICK, B.A. Oxon., Berkeley Fellow of the Owens College, Manchester. London : Kegan Paul, Trench, 1883. Pp. xvi., 375.

This is an ingenious and consistent attempt to work out a theory of Logic, or rather of so much of the substance of that science as falls within the writer's defined scope, from a rather original point of view. Readers of Mill's *Logic* will be familiar with a certain phraseology, enounced by him in regard to the import of propositions, about one thing or attribute being "a mark" of another. Mill's own treatise was too extensive, and, as I should express it, too objective in its general design and application, to make it centre round such a doctrine as this, but it is a possible view, and, for certain practical purposes, a useful one, as illustrated in the volume before us.

As the title indicates, the essay is concerned with the detection of Fallacy :—"I hold that to combat Fallacy is the *raison d'être* of Logic". It assumes that we have before us a definite *thesis* and may demand a reason for the same, and the inquiry is, What sorts of failure can there be in the application of the reason to the thesis? "The work before us is to survey, classify, explain, and illustrate the possible objections which can be brought against any belief, so soon as it is definite enough to take shape in language, and thereby to become a thesis for proof."

Such a design involves considerable departure from the methods and phraseology of the common systems. To begin with : instead of the threefold division naturally yielded by the two terms of the proposition, and the copula, these two terms themselves presenting as subject and predicate a more or less decidedly recognised difference of character, we have a duality only,—the mark and the thing marked,—both of these presenting the comparatively substantive character of a subject, and being symbolised accordingly by the letters S and S. The things which we may thus term "indicator" and "indicated" are to be understood of course with the widest possible latitude as to complexity, artificiality, and time or place-relation. Common language adopts many and various expressions for this relation, but we can always, with some violence to usage, translate it into the desired form : "the case of death may indicate (or point to) poison, or my pulse at the present moment may indicate (or show) the absence of fever, or yesterday's panic in the city may indicate (or foreshadow) a future increase of bankruptcy ; but it is undoubtedly clumsy to say that Bavius 'indicates the qualities of' a fool : we habitually condense those four words into the one word 'is'."

In an extended system of Logic, or examination of the principle of evidence in general, it would become necessary to discuss the foundations limits and ultimate warrant of this indication. This was what was intended in the above allusion to Mill. But in any detailed application of the principle,—such as the discussion

of Fallacies here,—we may conveniently stop short with the assumption of the fact of such indication.

One characteristic consequence of such a scheme meets us at an early stage, in the arrangement of the familiar propositions. According to the common system the distinction into affirmative and negative is considered as at least as fundamental as that between universal and particular, or even more fundamental. Those, however, who have worked at any of the recent systems of generalised or symbolic Logic have mostly found that this relative importance assumes a very different aspect there. Not only does the distinction between universal and particular become more important, but (if we wish to give an adequate interpretation to propositions with highly complex subjects or predicates) we have to credit the particular proposition with the special and peculiar function of guaranteeing the existence of its subject and predicate. Mr. Sidgwick's treatment does not lead him quite so far from ordinary convention as this, but it leads him in the same direction.<sup>1</sup> For instance, when we take Indication as our leading principle, the difference between indicating presence and absence becomes of minor importance in itself and is more obviously dependent upon the grammatical significance of terms or the convenience, in any given case, of proving a presence or an absence. That S is a mark of P and therefore the absence of P a mark of the absence of S; or that the absence of P is a mark of the presence of S and therefore the absence of S a mark of the presence of P, are statements which lead us in and out amongst ordinary affirmatives and negatives without much consciousness of any important change of character.

Now contrast with the above a case of *non-indication*. Suppose we say that S is not a mark of P; what does this mean and how are we to contrapose it? The reader unfamiliar with the matter will see his way best by looking at it in the guise of an ordinary proposition. That S *is* a mark of P implies that all S is P: that S is not a mark of P simply contradicts this, and therefore implies that some S is not P. The desired contraposition therefore is not what a beginner might hastily suggest, viz., that P is not a mark of S, still less that P and S have nothing to do with one another. It is, that absence of P is not a mark of absence of S. This and the original propositions are strictly equivalent and convertible propositions. Indications, therefore, whether of presence or of absence, correspond to universal propositions. They are very different in character from non-indications, which again, whether of presence or of absence, correspond to particular propositions.

A chapter is devoted to this subject of Contraposition, or rather,

<sup>1</sup> With the exception, however, that, with him (p. 223) particular propositions come out as *negative*, "every 'particular' proposition, so far as it makes a tangible assertion at all, is negative in our sense".

to use the term employed by Mr. Sidgwick, to "Counter-indication". As he remarks, contraposition is generally confined to categorical propositions, whereas a term is wanted which shall apply generally to *all* cases of indication including of course those which are put for convenience into the hypothetical form. The law is thus stated (p. 86), "All indication of  $\mathfrak{S}$  by  $S$  (affirmed or denied) is expressible as indication of  $S$  by  $\mathfrak{S}$  (affirmed or denied), if, and only if, the quality of both  $S$  and  $\mathfrak{S}$  be changed":—by the 'quality' being understood the positive or negative character of the indication, that is, the indication of presence or absence.

Relations of this kind are best expressible symbolically. Mr. Sidgwick employs for the purpose the symbols  $\rightarrow$  and  $\rightarrow\rightarrow$ .<sup>1</sup> Thus  $S \rightarrow \mathfrak{S}$  and  $\text{non-}\mathfrak{S} \rightarrow \text{non-}S$ , are a pair of such strictly equivalent counter-indications of an affirmative kind; and  $S \rightarrow\rightarrow \mathfrak{S}$  and  $\text{non-}\mathfrak{S} \rightarrow\rightarrow \text{non-}S$ , are a similar pair of a negative kind. The full tabular statement contains of course four of each kind. Mr. Sidgwick considers that the law of counter-indication is, however, never applicable directly, that is, never needed, in the case of concrete propositions. I should have thought that it might be equally applicable here. Take, for instance, the concrete and individual observation that my room at an inn has the bed in a certain corner; on going into a room and not finding the bed there I at once infer that the room is not mine. So in other cases, though, as Mr. Sidgwick says, in many instances we do really insert an intermediate abstract proposition.

The foregoing refers mainly to formal considerations. The latter part of the book is occupied with what may be called, by comparison, somewhat more material topics. The author's scheme, amongst other things, induces him to devote more space to the question of the "Burden of Proof" than is allotted to it in any ordinary handbooks. When we start very definitely with a thesis and the proof of it, the inquiry how we are to regard an unproved thesis, whether this be the one originally assigned or the statement advanced in proof of it, becomes of greater relative importance. Mr. Sidgwick has some good remarks upon this topic, but comes to the conclusion,—unavoidable in a formal treatise,—that no definite rules can be laid down. In the Law Courts indeed, as he remarks, somewhat stringent rules have to be laid down, for the sake of saving time and excluding needless subtleties, but in a system of formal proof we can say little more

<sup>1</sup> These symbols belong to a class which has been employed by a number of different writers to express 'indication' or 'implication'. They belong also to the sub-class of such symbols chosen expressly for the purpose of reminding us that such indications are not reciprocal or simply convertible. This they do by their one-sided aspect. (I see, however, that further on, p. 230, Mr. Sidgwick uses the symbol  $(-)$  for relation generally, which of course is not reciprocal.)

than that "He who asserts must prove," with the reservations and explanations, that whoever asserts that a thesis is *false* must accept a burden too, and that he who asserts a reason as sufficient, or claims that it is certainly insufficient, is in exactly the same position. The same holds good with him who asserts that an assertion is *doubtful*, and, moreover, he who asserts the most widely accepted doctrine cannot escape the "burden" of supporting it by reasons.

More than this cannot perhaps be said in a formal investigation, but it is worth spending a moment or two in seeing how the subject should be treated in a fuller inquiry into the principles of evidence. It has to be relegated to the field of Probability or Induction if we want to get clearer light upon the matter. Is it the fact that every proposition that can be uttered comes to us with a certain amount of presumption for or against it, which is to be incorporated along with the specific evidence or testimony, and duly allowed for in the determination of our assent? The subject may be looked at from two points of view. From the psychological side it may be urged that the mind does and must entertain a determinate amount of belief on every subject proposed to it. This is claimed by De Morgan, who "takes it for granted that, . . . every proposition, the terms of which convey any meaning, at once, when brought forward, puts the hearer into some degree of belief" (*Formal Logic*, p. 193). But for such belief to be of any value there must of course be some physical or external justification for it, and the question would then be, Are things so united together by causation or other uniformities that a really unique object or event cannot be found? I think that this must be admitted to be the case. With even our present knowledge of nature it would be hard to find a proposition as to which we should have to guess in blind and utter ignorance. *Some* ground, however slight, resting on Induction or Analogy or Probability would almost always be found; so that if the proposition could be submitted to a perfectly impartial umpire he might decide whether we were to put the initial belief as positive or negative. Practically this is clearly out of the question, but it deserves notice that the failure does not so much depend (as might be currently supposed), upon the total absence of all connecting links, but rather on the fact of there being so many of them, all excessively slight perhaps and telling in opposite directions, so that the resultant is quite incalculable.

The main outlines of the book may be indicated as follows:—The possible objections to an assertion may be of three different kinds: (1) We may be met on the threshold by the objection that it is not capable of either proof or disproof owing to its "unreal" character, such unreality arising either from its being merely tautologous, or self-contradictory, or involving terms which are devoid of meaning. (2) It may be objected that the Thesis is a mere assertion offered without support or justification. (It is

here that the discussion about the Burden of Proof, alluded to above, naturally comes in; for of course the speaker may claim that his statement starts with credit on its side which deserves definite disproof.) (3) Granting the reality and *prima facie* validity of the assertion, and the sincerity with which reasons are alleged in its favour, such reasons may be insufficient for well-grounded assent. This class of objections leads us into the central part of the subject, for they occupy the field of what are commonly known as Fallacies.

Of these Fallacies the following is the classification suggested, as likely to be offered by a fairly acute but not technically trained mind:—(1) That the reason given (or the objection) is beside the point. (2) That the reason given begs the question. (3) That some important factor has been overlooked or forgotten. (4) That if the argument be cogent, some absurdity (or at least untruth) must also be believed. The discussion of these classes, and the reference of the traditional fallacies of the text-books, so far as they fall within the scope of the treatise, to one or other of these divisions occupies a large part of the remaining chapters. The rest of the book is mainly occupied with a discussion which is always good, and often filled with acute and ingenious comment and illustration, upon the nature of the commonly recognised types of argument as seen through the light of the special medium of interpretation here adopted. Thus the nature of the arguments from Example, from Analogy, from Sign, and so forth, are discussed, and the special danger to which each is liable are pointed out.

It only remains to add that one minor feature in the work which is distinctly good is to be found in the novelty and appropriateness of the illustrations with which it is abundantly furnished.<sup>1</sup>

JOHN VENN.

<sup>1</sup> I am tempted to add a few remarks on one old example. It is the famous case of the St. Kilda islanders, and their habit of catching cold when visited by strangers, which occurs as an illustration in the handbook of Prof. Fowler. Mr. Sidgwick refers to Dr. Paris's *Pharmacologia*, from which Prof. Fowler took it. It is, however, much older than this. Dr. Johnson had a hearty scoff at the story, on his visit to the Hebrides, as described in Boswell's narrative of that journey. He heard of it from K. Macaulay whose work was published in 1764. The oldest reference I have seen is in M. Martin's account of his visit to the island, which took place in 1697. He had heard of the fact before and made many inquiries about it. He states that the people "contract a cough as often as any strangers land and stay for any time among them, and that continues for some eight or ten days. They say the very infants at the breast are affected by it."

As regards the explanation that the cause of the illness is not the coming of the strangers, but the N. E. wind which is supposed to accompany them, which finds favour with Dr. Paris, this had been already proposed in Boswell's time. It was a sheer guess of a certain "ingenious



*Studies and Exercises in Formal Logic, including a Generalisation of Logical Processes in their Application to Complex Inferences.*  
By JOHN NEVILLE KEYNES, M.A., late Fellow of Pembroke College, Cambridge. London: Macmillan, 1884. Pp. xii., 414.

This work belongs to the same class as Jevons's *Studies in Deductive Logic*. It is not so much a systematic treatise on the theory of the subject as a systematic collection of examples illustrating all the important points in that theory. To Jevons must be assigned the credit of having been the first to introduce into the study of Logic this important aid to intelligent instruction, familiar as it had long been in the cognate science of mathematics; but the present work seems to me in several respects to represent a decided advance over its predecessor. The range of examples in itself is better, the main principles of the science seem more clearly and consistently conceived, and are not marred by the few unfortunate crotchets with which readers of Jevons will be familiar. Moreover, in the latter part of the work, which deals with those generalised problems which have not hitherto been attacked without the aid of mathematical symbols, Mr. Keynes shows constructive sagacity and skill of a high order, and has, it seems to me, given us a real advance on anything hitherto effected.

From the nature of the case much originality is not to be expected or desired in the treatment of the traditional portions of

friend" of Dr. Burney, a Mr. Christian, resting on a queer fancy that people could not *reach* the island except with a directly fair wind:—Dr. Paris and others convert this into an inference that they could not *land* there but with this wind, the statement of the best authorities being that one can land with almost any but a S. E. wind, and best of all of course when there is no wind. The explanation has always seemed to me one of the most remarkable instances of ingenious absurdity. That the inhabitants of an island out in the Atlantic, who live by fishing and fowling, should find one particular wind, and that a comparatively dry one, try their sensitive frames passes all belief. Nor is the argument better than the facts. The pernicious wind is apt to blow at any time of the year, whilst strangers come only in the height of summer and that but rarely; in former days, the factor once or so in the year, and strangers but once perhaps in a dozen years. The wind apparently does not hurt the people unless it brings strangers with it, so that Dr. Campbell's solution at which Dr. Paris scoffed,—that the cause lay in 'the effluvium from human bodies,' was really in better accord with experience. The only reasonable discussion of the facts, as such, that I have seen is by Dr. T. E. Morgan (*Brit. and For. Med. Ch. Review*, 1862), who, visiting the island in 1860, found the people in the act of suffering from this so-called "boat cough" which they had just caught from the visit of another ship. After careful inquiries he fully admitted the truth of the strange account. He is inclined to adopt the contagion-theory, and to connect the facts with other well-known cases in which the inhabitants of very remote islands show a peculiar sensitiveness to certain infectious disorders.

the subject. One great merit of Mr. Keynes's work here consists in the variety and ingenuity of the examples devoted to the illustration of portions of the science which are very commonly neglected. To mention only one of these: the question whether, and in what sense, the existence of anything corresponding to our logical terms is presupposed in the statement of propositions and construction of reasonings, is almost uniformly disregarded—in fact no less an authority than Jevons himself has summarily remarked in reference to one such example which had found its way into an examination paper, 'that it must have been proposed under some misapprehension'. The following problem from Mr. Keynes's collection will serve to show how untenable such a view is:—"Whatever P and Q may stand for, we may show *a priori* that some P is Q. For all PQ is Q by the Law of Identity, and similarly all PQ is P; therefore by a syllogism in *Darapti*, some P is Q. How would you deal with this paradox?" To those who hold, as presumably most conceptualists do hold, and as Mr. Spalding explicitly claims—that the universal affirmative 'All X is Y' has no other meaning than 'All X, if there be any, is Y,' the question may fairly be put, how they avoid the immediate inference from 'X is Y' to 'XZ is Y'. Again, take the analogous subject of the truth or falsehood of the premisses of a syllogism; it has been summarily declared, as by Hamilton, that this is one of the subjects with which no logician has anything to do. But take the following example, which is but one of a class:—"Prove, by means of the syllogistic rules, that, given the truth of one premiss and of the conclusion of a valid syllogism, the knowledge thus in our possession is in no case sufficient to prove the truth of the other premiss". It is proved by showing "that if one premiss and the conclusion be taken as a new pair of premisses they do not in any case suffice to establish the other premiss," a fact which follows readily from the common rules of the syllogism. Of course it might be urged, and doubtless would be urged by Hamilton, that when we thus speak of substituting for a given proposition its contradictory, we are not in any way necessarily dealing with questions of truth and falsehood. But surely such an argument shows how very narrow and artificial is the boundary by which these latter considerations are excluded, for the moment we admit the conception of a test, no matter what, by which a proposition or its contradictory is to be selected in preference, we are deciding whether the former is to be considered true or false.

One among the few distinct innovations introduced by Mr. Keynes is a kind of immediate inference to which he gives the name of the *Inverse*, "by which, given a proposition having S for its subject and P for its predicate, we seek to obtain a new proposition having not S for its subject and P for its predicate". I feel some doubts as to the advisability of this introduction. It is urged indeed that starting from S and P we have eight possible

relations between S, P, not-S, and not-P, of which two are well recognised under the names of converse and contrapositive, and a third less so under that of obverse, and that symmetry demands the completion of the scheme. Mr. Keynes's discussion is very full, clear, and accurate, and he shows that of this "inverse" description only two cases are possible, *viz.*, from 'All S is P' we may infer that 'Some not-S is not P,' and from 'No S is P' we may infer that 'Some not-S is P'; the conclusion being in each case reached by successive recognised steps of conversion and obversion. This is true, and such relations ought certainly to be worked out for practice by the student. But it seems to me a doubtful advantage thus to add to the technicalities of the subject.

The part of the work which will probably excite most interest is that which deals with complex propositions. Mr. Keynes has shown that examples of a degree of intricacy which I should not have supposed could be grappled with except by aid of some kind of algebraic or symbolic procedure may be solved by generalisations of the common processes. Whether this can be regarded as "Common Logic," and whether the processes could be practically worked out except by those who had some experience in mathematical analysis is another question, but there is no disputing the great ingenuity of the methods here adopted.

The main process employed is a generalisation of the ordinary contraposition. From ' $P$  is  $Q$ ' we infer that ' $\text{not-}Q$  is not  $P$ '. Apply this to the proposition that ' $X$  is  $Y$  or  $ZW$ ', and we infer that ' $\text{what is not } (Y \text{ or } ZW) \text{ is not } X$ '. This calls for a simple rendering of the contradiction of a complex term. Mr. Keynes adopts substantially that which was first suggested, I think, by De Morgan, and first worked out in detail by Schröder, and which may be expressed in common language by saying that "for each simple term involved we substitute its contradictory; and everywhere change *and* for *or* and *or* for *and*" (p. 294). This makes the contradictory of ' $Y$  or  $ZW$ ' appear as ' $y$  and ( $z$  or  $w$ )', adopting the notation that not- $X$  is represented by  $x$ , and that juxtaposition of letters is equivalent to their combination by *and*. From the original proposition therefore we infer that ' $\text{what is } y \text{ and either } z \text{ or } w \text{ is } x$ '. In order to obtain  $y$  separately from this, we need to invoke a second method of which large use is here made. It may be stated in single letters thus: 'If  $PQ$  is  $R$ , then  $P$  is either not- $Q$  or  $R$ ' (this is the common-logic equivalent for the Boolean symbol of *division*). Applying this to the above complex expression it yields ' $y$  is neither  $z$  nor  $w$ , or it is  $x$ '; or more simply  $y$  is  $ZW$  or  $x$ .

The above is a mere sample of some of the processes employed. That they are effective enough may be judged by the fact that the solution is given of the following problem, involving ten terms:—

Given  $bc$  is  $DE$  or  $Df$  or  $hi$ ,  
 $C$  is  $aB$  or  $DEFG$  or  $BFH$ ,  
 $Bcd$  is  $eK$  or  $hi$ ,  
 $Acf$  is  $d$ ,  
 $i$  is  $BC$  or  $Cd$  or  $Cf$  or  $H$ ,  
 $ABCDEFGH$  is  $H$  or  $I$ ,  
 $DEFGH$  is  $B$   
 $ABk$  is  $f$  or  $h$ ,  
 $ADFIk$  is  $H$ ,  
 $ADEFH$  is  $B$  or  $C$  or  $G$  or  $K$ ;  
 show that  $A$  is  $K$ .

I have no space to do more than briefly indicate some of the criticisms suggested by these methods. In the first place are they actually more compendious and effective than those which we already possess? It is hardly possible to answer this inquiry summarily, because so much depends upon the extent to which, in any given example, we make appeal to such intermediate formulæ as we may have already established and can thus take for granted. But, speaking generally, it seems to me that Mr. Keynes's plan is at least as effective as any other when we are dealing with propositions couched originally in the predicative form  $P$  is  $Q$ , but I rather prefer methods of the Boolean kind where our data fall into the equational type  $P = Q$ . I think also, but may be liable to prejudice here, that the speculative questions which give these advanced logical processes their main value—*e.g.*, the nature of limiting cases, the interpretation of symbolic forms—are more instructively set before us when we make appeal to some extent to mathematical or other symbols. But the further question arises whether these methods can fairly claim to belong to the Common Logic at all. It must be frankly admitted that no symbols are introduced beyond those universally employed in the older treatises, with the slight exception of the abbreviation  $x$  for not- $X$ . On the other hand the spirit of the methods is throughout of the mathematical type in regard to the generalisations employed; and some of the processes—as, for instance, the combination of propositions with disjunctive predicates—are to all intents and purposes translations into common language of the 'multiplication' of Boole and others. I feel tolerably sure that Mr. Keynes himself would not have worked out his scheme unless he had been a thorough adept in the more symbolic methods, and I rather doubt if there are many of the adherents of the old scheme who will be able, without his training, adequately to appreciate these very ingenious modifications of it.

J. VENN.

*Dynamic Sociology, or Applied Social Science, as based upon Statical Sociology and the less Complex Sciences.* By LESTER F. WARD, A.M., 2 vols. New York: Appleton, 1883. Pp. 706, 690.

This acute, original, and somewhat bizarre book might be succinctly described as 'Practical Proposals for a Short Cut to Utopia,' or rather, its able author intends it for that: but in reality its proposals are on the whole quite as impracticable as those of most other previous realistic Utopia-mongers. In the main, indeed, the work is fundamentally political in its motive, and as such it would demand no notice here: but the treatment is so purely philosophical, and the psychological passages are so numerous and often so interesting, that it calls for some slight criticism, from this side at least, on the part even of a specially philosophical and psychological journal. Here in brief is a bald *résumé* of Mr. Ward's central envisagement of the great sociological problem.

Happiness is the final end of all human endeavour. It can only be attained or increased for the mass of men by means of Progress. But Progress hitherto has proceeded by the wasteful natural method of evolution. This implies a constant rhythm, a sort of tidal wave, now advancing, now receding, in which the total gain is measured only by the excess of the forward impulse over the nearly equal backward one. Natural selection is a slow and uneconomical process: artificial selection is far more rapid, direct, and effective. In the one case, the better organisms only slowly survive in a life and death struggle with the worse-endowed; in the other case, the best breeders are chosen beforehand, and the conditions are rendered as easy as possible for the most desirable among the offspring. Even so sociology and social development must pass from their present passive or natural stage to an active, artificial, and teleological stage. At present, whatever advance man makes is made by natural selection, and is in one sense the result of chance. But just as man has directed the development of his domestic animals by artificial selection, so must he direct the development of his own social organism by the application of a teleological method. The old slow and imperceptible genetic progress must be superseded by a new and rapid purposive progress. The social forces must be controlled by intelligent design. How is this end to be attained? By the diffusion of knowledge. It is want of knowledge that keeps men back from progress. If every man were fully and properly educated, progress would be pursued as a definite aim, sociology would enter the dynamic phase, and happiness would be in train of universal acquisition. Education is Mr. Ward's panacea for all the ills that flesh is heir to: the cure for our curse of overworked millions on the one hand, and unemployed millions on the other.

Viewed in itself, this central theme is so familiar, trite, and almost trivial, that Mr. Ward might seem to have hard work in

spreading it out over two solid and bulky volumes. In reality, however, he has gone so deeply into the matter, and has wrought out his theory so logically from first principles, that his book commands respect not merely as a complete and fully-rounded social philosophy of its own sort, but also as a curious piece of strictly original and independent thinking. What with the ordinary prophets of education is a pious opinion, is with Mr. Ward a logical conclusion, as rigorously deduced from given premisses as a proposition of Euclid. In fact, this very rigour is at once the great charm and the great stumbling-block of the book: on the other hand, it preserves the author at every step from needless digression or rhetorical display, but on the other hand, it leads him into an excessive and inordinate schematism, accompanied by its usual concomitant of needless neology, or at least of a technically limited and crabbed terminology.

The book begins with an introductory chapter, in which this central idea of a Dynamic Sociology—an art of progress based on the science of man and the other less complex sciences—is clearly sketched out: and the province of that art is summed up as “to overcome these manifold hindrances to human progress, to check this enormous waste of resources, to calm these rhythmic billows of hyperaction and reaction, to secure the rational adaptation of means to remote ends”. The introduction is succeeded by two historical chapters on the philosophic systems of Comte and of Herbert Spencer, which are really quite unnecessary in their actual context, and only serve to swell a very big book to still bigger dimensions. True, they illustrate the way in which Mr. Ward himself arrived at his own theories, and so they are of a certain personal genetic value to him, no doubt: but they contain little more than a *résumé* of what every one of Mr. Ward's readers doubtless already knows—the *Philosophie Positive* and the *System of Synthetic Philosophy*. Our author, however, seems to us to do scanty justice to Mr. Spencer, and greatly to underrate his own indebtedness to all his works, especially the essay on Education. His summary of Mr. Spencer's position will probably be read with some amusement on this side of the Atlantic:

“Mr. Spencer has steadfastly declined to be drawn by his logic into anything that even the most incredulous could call a vagary. *No man probably ever wrote as much as he has written without saying more than the average judgment of mankind could not indorse as soon as presented.* This is due to the firm manner in which his reason is enthroned, and the all-sided and practical wisdom with which his extensive information enables him to survey every problem. But it is just these qualities that render him unsystematic, non-constructive, and non-progressive. Paradoxical as it may sound, and whether it be construed as complimentary or otherwise, Mr. Spencer has too much good sense and too much real knowledge to build a perfect system of philosophy.”

The words we have ventured to italicise are certainly curious as applied to one of the best-abused and most vilified of all philosophers, ancient or modern.

With a laudable desire to make his own theory (unlike Mr. Spencer's) thoroughly systematic, Mr. Ward next proceeds to found his dynamic sociology upon a solid and reasoned cosmical ground-work. He finds it necessary, in fact, to construct a philosophy of the universe, as preliminary to his speculations (or demonstrations) upon the means for attaining the maximum sum of human happiness. Nobody can deny that in this he is perfectly right: but it would certainly seem more natural to set forth one's cosmical philosophy first as a substantive theory, rather than prefix it as an introduction to a single treatise on Dynamic Sociology. In this portion of his task, Mr. Ward attaches much importance to the "Law of Aggregation," as distinguished from that of Evolution proper; though curiously enough he nowhere definitely formulates exactly what he conceives this so-called Law to be. He begins with Primary Aggregation or Cosmogony, and then goes on to Secondary Aggregation as exemplified in Biogeny, each of which subjects occupies a long chapter. Though the questions dealt with here lie somewhat outside the province of MIND, it may be mentioned in passing that Mr. Ward's grasp of the latest scientific doctrines is very firm and comprehensive, and that these chapters display an extremely high degree of co-ordinating scientific faculty. In fact, they seem to us by far the best thing in the whole book. From Biogeny, Mr. Ward passes on to the alternative aspect of Secondary Aggregation as Psychogeny, or genesis of mind. Regarding spontaneous motility as the fundamental distinguishing property of protoplasm, he considers that sensibility is intimately bound up with irritability, and assumes therefore that consciousness inheres in every molecule of protoplasm to a certain limited degree. Of the deeper problem, What is the protoplasm *minus* the consciousness? What is matter itself out of relation to, or prior to, a percipient mind? he takes little or no notice. Starting from these elementary molecule souls (the expression is not Mr. Ward's) he traces the gradual development of the higher forms of consciousness, and especially of "will," and of "intellect". In this connexion he distinguishes strongly between intellect and intelligence—a distinction of much importance to his subject in the later portions of his reasoning. Intellect represents the mere mental capacity, in one word, the *form*: intelligence embraces all that is implied by intellect, together with all its registered experience, in one word, form *plus* matter: or, as Mr. Ward himself puts it, intellect *plus* knowledge. It is a favourite thesis with him that the intellect of mankind has increased very little since the days of Plato and Aristotle, but that the intelligence has increased immensely.

"The reason why the intelligence of Europe and America to-day is so much greater than that of Greece and Rome two thousand years ago is not to any great extent because the power of intellect, or co-efficient of intelligence, has increased, but because the acquired knowledge is so much greater



both in quantity and quality. And this, when sifted to the bottom, may be attributed to the more universal practice of recording, preserving, and inculcating on succeeding generations the truths learned by preceding ones and found by experience to be most valuable. The general deduction which follows of itself from these facts obviously is that, where intellect is equal, intelligence will vary with the amount of *education*."

We may pass over the chapter on Anthropogeny, which contains nothing new to readers of the calibre for whom Dynamic Sociology is designed—scarcely anything more than arguments in favour of the now accepted doctrine that man descends from a simian ancestor—and proceed at once to that on Tertiary Aggregation or Sociogeny, which embraces an immense amount of novel and very suggestive matter. To give a summary, even the briefest, however, of this long and interesting essay would be impossible within the limits at our disposal: Mr. Ward has done so himself in schematic outline at vol. I, pp. 480-482, and his table of heads alone, there set forth, occupies nearly three entire pages. This chapter closes the first volume, which is thus entirely given over to clearing the ground for the effective development of the Dynamic Sociology.

The real work of the treatise begins in the second volume. Unfortunately, it does not fully come up to the promise of the rather lengthy and wasteful preamble. Mr. Ward's *ἔργον* is inferior on the whole to his *πάρεργα*. Setting out with the position of man in the world, as a conscious, intelligent, purposive agent, in the midst of an unconscious, non-intelligent, blindly active environment, he declares that man should not rest content with being the *minister et interpres naturæ*, but should aspire on the contrary to be her master—not *parendo* but *sciendo imperare*. Though intelligence is merely a product of evolution, it can itself further and advance evolution in future, by substituting the teleological method of purposive endeavour towards a definite end, for the genetic method of blind advance towards the empirically established better. "Society can and should seriously undertake the artificial improvement of its condition upon scientific principles strictly analogous to those by which the rude conditions of nature have been improved upon in the process which we call civilisation."

How is this to be done? Not by what Mr. Ward describes as the "direct method of conation," that is to say, by an endeavour to take happiness by storm—to get at it by immediate effort; but by what he calls the "indirect method of conation," that is to say, by ascertaining and ultimately producing the conditions under which alone increase of happiness is really possible. What these conditions are, Mr. Ward sets forth in the following systematic table of the Theorems of Dynamic Sociology.

"A. Happiness is the ultimate end of conation.

B. Progress is the direct means to Happiness; it is, therefore, the first proximate end of conation, or primary means to the ultimate end.

C. Dynamic Action is the direct means to Progress; it is, therefore, the second proximate end of conation, or secondary means to the ultimate end.

D. Dynamic Opinion is the direct means to Dynamic Action ; it is, therefore, the third proximate end of conation, or tertiary means to the ultimate end.

E. Knowledge is the direct means to Dynamic Opinion ; it is therefore, the fourth proximate end of conation, or fourth means to the ultimate end.

F. Education is the direct means to Knowledge ; it is, therefore, the fifth proximate end of conation, and is the fifth and initial means to the ultimate end."

The whole of the second volume is an expansion and elaborate justification of the six theorems thus formally set forth. Happiness is shown to be the one ultimate good, which may be sought directly by the individual, but can only be attained by the society through indirect means. It is demonstrated with much show of mathematical cogency that the only means of so attaining it is through progress : that progress again is only possible through dynamic action ; and so on until at last we come to the final means, education.

Two criticisms must be passed upon this last rigorously demonstrative portion of Mr. Ward's work. In the first place, it is vitiated throughout by the deliberate and dogmatic reiteration of the astounding Jeffersonian paradox, that all men are born equal. By adopting this pre-Darwinian figment, Mr. Ward throws overboard a great part of all modern biological truth, and utterly ignores the overwhelming value of hereditary influences. Over and over again he talks as though almost all human beings were equally capable of education : once he even asserts that the large additions made to science and literature by persons placed in high official or professorial positions indicate that almost anyone else put in the same place would have done equally well. He thus quietly ignores the fact that these people were put there just because they possessed congenital faculties which fitted them for doing that particular work ably and well. Is it not a transparent absurdity to say that almost anybody else would have made as good an Astronomer Royal as Sir Wm. Herschel ? It would be easy enough to understand such an argument if it came from essentially aristocratic England, where any man who happens to be born a duke is considered good enough to make a cabinet-minister : but coming from democratic America, with its career open to the talents, it is simply extraordinary and almost incredible. Hardly a page in Mr. Ward's later chapters is free from the initial fallacy thus boldly set forth. It is assumed time after time that though intelligence differs widely, intellect is everywhere about the same : that most people are capable of being educated up to that dynamic opinion which would finally ensure the triumph of progress. We should gather from this that Mr. Ward has had no practical personal experience in the work of teaching. In a class of 15 boys of 15 years old taken from the exceptionally intelligent English upper and middle classes, it may be safely asserted that only three on an average can ever be taught really to understand, we do not

say the fifth, but the first proposition of the first book of Euclid. Of the remaining twelve, some six might be taught it so far by rote that they could repeat it correctly even if the letters in the figure were transposed: three could probably learn it by heart, but without being able to repeat it with variations in the letters: and three more would be incapable of repeating it at all in any way. When this is the case even in congenitally intelligent classes (relatively speaking) what can we expect that education will do with the less developed intellects of the ignorant masses? How many generations must pass by before we have begun appreciably to affect their "coefficient of intelligence,"—their brain and nervous system? The error is a strictly psychological one: it consists in vastly underrating the primordial difference between brains—a difference so immense that the majority of men are probably born incapable of ever receiving in the most passive manner those facts and truths which alone would lead toward "dynamic action". What percentage of Aryan children, even, for example, does Mr. Ward suppose to possess minds into which the simplest correct ideas about the solar system could ever by any method be instilled?

The second point is a still more fundamental one. Mr. Ward's "means to the ultimate end of conation" do not go quite far enough. He stops short at education, which he calls "the last proximate end and initial means" to the final attainment of happiness. But how are we to ensure such an education as Mr. Ward sketches, even for that very small minority which might perhaps be congenitally capable of assimilating it? We must confess that we read his last chapter with a bitter feeling of disappointment. After so much flourish of trumpets, we had hoped that Mr. Ward had really got hold of some practical suggestions for bringing about the excellent education he desires. Unfortunately, he has none, and his book thereby stands self-condemned. It is not Dynamical at all. The mainspring is entirely wanting. The final means to the great end is never even alluded to. The real education which Mr. Ward would like to see made general, we know to be utterly repugnant to the feelings of the vast majority of men. It can be realised in the end solely by the slow action of that wasteful genetic process of which Mr. Ward speaks throughout with so marked contempt. Only by gradual increase of the knowing few at the expense of the ignorant or wrong-headed many can a public opinion arise which would even tolerate a national system of scientific education. There do exist plenty of national educational systems at present, and they are almost all impartially condemned by Mr. Ward as bad in method and useless in content. How, then, can any other system be introduced so long as men at large think as they do think? In the last resort, Mr. Ward himself must fall back upon the genetic method, and must be content to aim at influencing the solitary opinions of a few already intelligent and mainly sympathetic individuals.

He cannot escape from the natural helplessness of the dissatisfied social unit: and the perusal of his last word only strengthens in us the feeling that the one consistent attitude of the would-be dynamic sociologist must be an attitude of "refined despair". In order to start his Utopia he has nothing to do save to convert the world: but then—. In short, he could do a great deal if only he had a *ποῦ στῶ*. In this vicious circle, Mr. Ward's *Dynamic Sociology*, it seems to us, revolves aimlessly, and leaves the real work of evolution to be still performed by the much despised agency of natural as opposed to teleological causes.

GRANT ALLEN.

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*The Origin of Ideas.* By ANTONIO ROSMINI SERBATI. Translated from the Fifth Italian Edition of the *Nuovo Saggio sull' Origine delle Idee*. Vol. II. London: Kegan Paul, Trench, 1883. Pp. xxiii., 501.

Having in those sections of the *Nuovo Saggio*, which the Translators issued some months ago as Vol. i., criticised and repeated all previous theories respecting the origin of ideas, Rosmini proposes his own theory in the elaborate section which makes up the present volume, and we thus reach the positive part of his doctrine. But there is in it little more than reiteration in lengthy detail and in continuous systematic form of the occasional short statements of his discoveries and views which were found here and there in Vol. i., and summed up in MIND XXXI. And it is doubtful whether the expansive treatment of this volume does not make his position more obscure and questionable. He begins with an examination of that innate intuition of possible and quite indeterminate or characterless Being, which he takes to be the *sine quâ non* of intellection or knowledge in general. For a sufficient account of this innate idea or "concept" of being, see the notice referred to. "Being is the light shining in our mind by nature". Every intellectual act supposes it. Every other idea is purely derived from it, or compounded of it with matter of sense. Our first principles of reasoning are only so many ways of applying it. From it, he gets our concepts of Cause, Substance, Body "animate and inanimate," Time, Motion, and Space. This is the sum and substance of the present volume.

Great pains is taken to show that the priceless concept does not come of sense, because it is objective or in-itself, only possible or ideal, "simple" and characterless, one and always the self-same, universal, necessary, immutable, and eternal. Nor will Locke's reflection give it, nor abstraction or generalisation; and, yet, Rosmini calls it "the last of abstractions," and says "Beyond this it is impossible for abstraction to go without our losing all object of thought, or in other words, ceasing to think"! There may be an obstinate doubt in some minds whether this consummation which the pessimists so devoutly desire, would not

occur sooner. Dwelling on this void and blank Beingness, is much like the fakir's dwelling on 'Om'. However, this elaborate elimination of all other possible sources is the "demonstration" that it is "innate" in us, and that it is in fact the very *umbilicus* of all our thinking and of our intellectual being. When we gaze on it, we gaze on our own spiritual navel. Let us see what comes of this concentration, since according to Rosmini all our ideas come of it. "All our *acquired* ideas are a compound of matter and form," and their "twofold cause is the idea of being and sensation". "*Pure* ideas," again, "take nothing from sense," and simply issue from the innate intuition, as for example, the principle of non-contradiction, because when reduced to its simplest terms, it is no more than to say, "Being cannot at the same time not be," and possibility cannot be impossibility! From this, "Causation" follows, because "To say that which does not exist, operates, is a contradiction". Of course, "substance and accident" are simply "cause and effect" taken statically. "Operation" of an agent rather than invariable antecedence or concomitance, is with Rosmini the essential fibre of causation, and his attitude, here as always, is ontological and scholastic. It is easy, therefore, to see, that from feelings felt he will infer a subject, soul or Ego feeling them, refuting Hume, and "body as the proximate cause of our external sensations," refuting Berkeley. But all this appears to be only a very learned and elaborate repetition of Reid and his school, for whom Rosmini has the sincerest respect and gratitude.

In his treatment of the ideas of Time, Motion, and Space, which he, in contrast with the finding of Kant, finds to be only abstract and acquired ideas, there is much speculation that is curious and interesting about the discontinuity of Time and Motion. The continuity and infinite divisibility of Time is an illusion, because "All that happens must happen by instants," though it is difficult to see how there can be room for anything to happen in an absolute instant, or how the instant itself can effect a footing in Being without duration. The most absolute barest instant must at least *last* an instant. That "the real continuity of motion is an absurdity" is, of course, an inference from the real discontinuity of Time.

What remains of the book—some 150 pages—is taken up with the psychology of Sense-perception, but we fail to find in it any valuable contribution to the science of the day.

On the whole, Vol. ii. is a disappointing one, and at the end of it, we do not find ourselves carried, in matters of genuine philosophical import, much beyond where Vol. i. left us, and must wait for some clearer light to come in the third and last volume, with the patience of hope.

J. BURNS-GIBSON.

### VIII.—NEW BOOKS.

[These Notes do not exclude Critical Notices later on.]

BENEDICTI DE SPINOZA *Opera quotquot reperta sunt*. Recognoverunt J. VAN VLOTEN et J. P. N. LAND. Volumen posterius. Hagae Comitum apud Martinum Nijhoff, 1883. Pp. x. 634, with portrait and facsimiles of handwriting.

*The Chief Works of BENEDICT DE SPINOZA*, translated from the Latin, with an Introduction by R. H. M. ELWES. London: George Bell & Sons, 1883. Pp. xxxiii. 387; xxii. 420.

Our first duty in noticing the completion of the Dutch Committee's edition of Spinoza—the first really correct and complete edition, it is well to repeat—is to join in Prof. Land's regret for the loss of his colleague Dr. Van Vloten, who was carried off by a rapid illness in the autumn, just before the work was finished. The revived study of Spinoza, both in the Netherlands and elsewhere, owes much to Dr. Van Vloten's constant vigour and enthusiasm. In this volume we have Spinoza's Letters, now for the first time duly collected in order of time, critically edited, and furnished with all attainable information as to names of persons and other matters omitted (for the most part of set purpose) in the *Opera Posthuma*. Where an original Dutch text is preserved, that text is here given as well as the Latin version, and a good many of the details supplied in the notes will be practically new to students; we say practically, for the editors' task was not so much that of bringing new matter to light as the far more troublesome and less grateful one of ordering scattered materials which had never been thoroughly dealt with as a whole. Examination of the Royal Society's manuscripts has however revealed a couple of unpublished paragraphs in letters from Spinoza to Oldenburg, and a great number of minute variations throughout the text of these letters, which show that Spinoza must have carefully prepared for eventual publication the copies which he kept.

The Dutch text of the *Korte Verhandeling* (Spinoza's early treatise on God and Man, first published by Van Vloten in 1862) is not accompanied by a Latin version, the editors having been of opinion that sufficient provision was already made in that behalf by Schaarschmidt, Sigwart, and Janet. Under the peculiar circumstances there is no reason to dissent from their conclusion. In a standard edition like the present a Latin version of this work, if undertaken at all, must have aimed at restoring the lost original as nearly as possible in the form that Spinoza gave to it. This might probably be done with a fair degree of approximation, but certainly would cost more trouble than it could be worth.

An excellent etching reproduces the Wolfenbüttel portrait of Spinoza, which appears to be accepted by experts as the archetype of the better known engraving found in many copies of the *Opp. Posth.*, as well as of the picture now in the town museum at the Hague. The miniature bought some time ago by the late Queen of the Netherlands, which is of a different type, is conjecturally identified with the picture of Spinoza said to have been taken by his host Van der Spyck. One would like, however, to have more external evidence about this miniature. Apparently there is nothing to warrant it but its general coincidence with the description of Spinoza's person in Colerus.

Mr. Elwes gives us the first complete English translation of Spinoza's principal works in two handy volumes, with a modest, concise, and careful Introduction. As far as can be judged from a cursory inspection, it is a solid and scholarly piece of work. It is only to be regretted that Mr. Elwes has not had the advantage of the Dutch editors' text for the Letters. In translation, however, they have been purposely abridged to some extent by omissions of non-philosophical matter, which makes this of less importance. One is also disposed to regret that Mr. Elwes did not, while he was about it, include the *Korte Verhandelng*, of which we have no English version at all. It is true that the interest of the work is chiefly in the witness it bears to the gradual development of Spinoza's ideas and his relation to contemporary speculation, which is the affair of special students. But this is equally true of many of the Letters, and of considerable parts of the *Tractatus Theologico-politicus* and the *Tractatus Politicus*.

It may be not irrelevant to cite here a lately published tribute to Spinoza from an unexpected quarter, the letters of Gustave Flaubert to George Sand which have appeared in the *Nouvelle Revue* (Jan. 15, 1884, p. 251). Speaking of his *Saint-Antoine*, Flaubert says :—"Je vais m'y remettre dans une huitaine, quand j'en aurai fini avec Kant et avec Hegel. Ces deux grands hommes contribuent à m'abrutir, et quand je suis de leur compagnie, je tombe avec voracité sur mon vieux et trois fois grand Spinoza. Quel génie ! quelle œuvre que l'*Éthique* !" [F. P.]

*Outlines of Psychology : with special Reference to the Theory of Education.*  
By JAMES SULLY. London : Longmans, 1884. Pp. xxiv. 705.

This work consists of fourteen chapters. The first three give a general account of mental phenomena and their laws. Then follows a chapter on Attention, after which come six chapters dealing with the successive stages of intellectual development, namely, Sensation, Perception, Reproductive Imagination, Constructive Imagination, Conception, Judgment and Reasoning. Two chapters are reserved for Feeling, and two for Volition. The work, while following in the main the traditions of English psychology, seeks to assimilate the more important results of German research. Considerable use has been made both of the Herbartians, particularly Waitz and Volkman, and of the school of physiological psychology of which Lotze was perhaps the principal founder. The early stages of mental growth receive special attention, an attempt being made by the help of personal observation, supplemented by the researches of others, to assign approximately the date at which the more important psychical products, e.g., perception of distance, judgment, first manifest themselves. A practical turn is given to the exposition by bringing out the bearing of psychological principles on the conduct and cultivation of the mind, and special sections are occupied with tracing out their main applications to the art of Education.

*The Relations of Mind and Brain.* By HENRY CALDERWOOD, LL.D., Professor of Moral Philosophy, University of Edinburgh. Second Edition. London : Macmillan, 1884. Pp. xx. 527.

This second edition of Dr. Calderwood's work (originally published in 1879 and reviewed in MIND XVII.) includes a considerable quantity of new matter, for which room has partly been made by a pruning of several of the more argumentative chapters. One entirely new chapter on "Animal Intelligence" is interpolated in the middle, running to a length of 90 pp. ; and there are a few other insertions. The actual increase of bulk is about 70 pp. The chapters descriptive of the nervous system are practically unchanged. No attempt has been made to incorporate the more recent



results of physiological research, for example, in the matter of localisation of function; but these, it may be said, do not affect the author's contention. More to be remarked is the absence of any effort to supplement positive omissions in the original view of the working of the nervous system; for instance, the process of inhibitory action within the system is still made only the subject of passing allusion here and there, though nothing could be of greater import for the discussion of "Experience as connected with Motor Activity". The omissions now made are all good, being mostly of rhetorical passages, as at the end of c. vii. and throughout c. xv. (original numbering), which weakened instead of adding force to the general argument of the book. This is now made still clearer than it was by the new chapter on "Animal Intelligence". Here Dr. Calderwood does excellent service by bringing expressly into view the peculiarities of sense-endowment distinguishing the different classes of animals (ants, dogs, &c.), for which exceptional intelligence is claimed; and he is thus able to account for much in their action that is too readily regarded as mysterious. His own position is, that, beyond a highly-developed and varied sensibility, nothing is needed to explain the so-called intelligence of animals but action of a mechanical type provided for by fixed connexions between sensory and motor cells in the brain and other nerve-centres; whereas human intelligence (properly so called—for more of human action than is generally supposed is of the merely animal kind) is *only* to be understood as referable to a hyperphysical entity, which somehow can be affected and operate through brain but has its being in a region wholly apart. In short, the old doctrine of Animal Automatism *versus* Human Conscious Intelligence, accommodated to modern physiological speech. The position, however, is far from consistently maintained. If the sensibility of animals is mere physical affection, as Dr. Calderwood would fain represent it when he has his ultimate conclusions in mind, it is difficult to see how he can interpret such facts of canine sense of wrong-doing as he still reports at p. 140 (without heed to Dr. Maudsley's doubts vivaciously expressed in *MIND* XV. 412). On the other hand, if, in spite of such uncertainty and wavering speech as we find, *e.g.*, at p. 193, § 4, he cannot seriously be supposed to deny to animals something analogous to our conscious experience of Sensation, it is no less difficult to see how he can then be satisfied with the notion of mere "mechanism" in animals and not in their case also find it necessary to refer such subjective experience as they have (whether to be dignified as "personal" or not) to a hyperphysical region of being; which unsettles everything again. In the case of man, the plain question that will not be suppressed is, whether Dr. Calderwood thinks that the brain is called into play only when some stimulus is being received from without or impulse is being sent out from within; and is not also somehow implicated in and with every mental process, high or low, so that nothing is at any time going on in the mental sphere without its proper cerebral concomitant. If he does so think, it is perhaps enough to say that he will hardly win credit at this time of day with either psychologist and physiologist, on the one hand, or with philosopher, on the other. Alike in regard to phenomenal facts, subjective and objective, and from the point of view of metaphysical interpretation, the kind of dualism which he seeks to revive gives little rest to the sole of the foot.

*The Unity of Nature.* By the DUKE OF ARGYLL, Author of *The Reign of Law*, &c. London: Strahan, 1884. Pp. xv. 571.

The author, having intended to follow up the chapter on "Law in Politics" in his *Reign of Law* (1866) with a concluding chapter on "Law in Christian Theology" which should involve a reference to some of the

most fundamental facts of human nature, found the subject too serious to be so disposed of, and has in all the intervening years been occupied with but a part of the preliminary investigation: at least the present volume which traces "the connexion between the Reign of Law and the ideas which are alike fundamental to all Religions and inseparable from the facts of Nature," seeks only "to establish some method of inquiry and to find some sure avenue of approach" to the question beyond. Parts of the subject have been separately treated from time to time, but are now fused into a connected whole; the attempt to define man's place in or in relation to nature having interwoven with it an argument for the trustworthiness of the human faculty of knowledge by which the inquiry has to be pursued. Content with a doctrine of Relativism, which is however very different from the current philosophy of Nescience, the author would include man within the unitary scheme of nature, and accepts with a certain boldness some implications of the position which others are fain to deny; but at the same time, as the result of an investigation into the moral side of human nature, he finds man to be after all "The Great Exception," with possibilities of degradation, in the exercise of rational faculty, from which every other living thing is exempt. He is thus led to contest the prevailing scientific assumption that savage life at the present time gives indications of the prehistoric condition of the human race; also current views as to the origin and development of Religion. Mention may be made of the brightly-written discussion on Animal Instinct in ch. 3. It is pertinently urged at p. 92 against the 'lapsed-intelligence' theory of instinct that "if the habits and powers which are now purely innate and instinctive were once less innate and more deliberate, then it will follow that the earlier faculties of animals have been the higher and that the later faculties are the lower in the scale of intelligence".

*Leibniz.* By JOHN THEODORE MERZ. "Philosophical Classics for English Readers." Edinburgh and London: Blackwood, 1884. Pp. viii. 216.

In this discussion of the character of Leibniz and the spirit of his philosophy, the author has endeavoured to confine himself as much as possible to those points in the life and doctrine which cannot be easily gathered by a perusal of Guhrauer's biography, of the principal works of the philosopher himself, or of the well-known historical treatises of Ueberweg, Kuno Fischer, Erdmann and Zeller. Supposing these to be of easy access, he hopes that those who have not read them may be better prepared by this volume to do so, and that those who have read them may find something in it which the larger works did not readily supply. The treatment falls into two parts: (1) "Leibniz's Life and Genesis of his Philosophy" (pp. 1-134); (2) "The Philosophy of Leibniz" (pp. 135-216).

*Lectures on the Philosophy of Law, designed mainly as an Introduction to the Study of International Law.* By WILLIAM GALBRAITH MILLER, M.A., LL.B., Lecturer on Public Law (including Jurisprudence and International Law) in the University of Glasgow. London: Griffin, 1884. Pp. xv. 432.

As this book, departing from the common English usage, professes to deal with Jurisprudence "from the metaphysical point of view," we hope to return to it in a future number. Besides enlarging upon the "Utility of Philosophy" in his Introduction, the author takes distinctively philosophical ground in at least three (out of the thirteen) lectures—(1) "Law and Metaphysic," (12) "Retrospect of the Development of Law through the [Kantian] Categories," (13) "Law, Morality and Religion"; and also finds his profit in the use of philosophical speech throughout.

*An Examination of the Philosophy of the Unknowable as expounded by Herbert Spencer.* By WILLIAM M. LACY. Philadelphia: Lacy, 1883. Pp. iv. 235.

"To the scheme of nescience" the author opposes "the doctrine that we are capable of realising something of the nature of things occupying the region outside of consciousness. It is not meant by this that immediate knowledge of anything not present in consciousness is possible. No one is more firmly convinced than" the author "that there can be no consciousness, strictly so-called, of what is beyond consciousness. But that there can be genuine thought of something not within consciousness, is an independent proposition, and the one here urged as true." "To the issue the doctrine of Evolution is not a party." The Philosophy of the Unknowable "is not indispensable to the Philosophy of Evolution, but is rather a complication from which that philosophy should be glad to extricate itself. That evolution is only a law of appearances, not a law of things, is a thought fraught with disheartenment and burdened by a weight of complex subtleties. No evolutionist should harbour sentiment repugnant to the tenet that realities are the subject-matter of the process of evolution and of the Evolution Philosophy."

*Common Sensibles: Die Gemein-Ideen des Gesichts- u. Tastsinns nach Locke u. Berkeley u. Experimenten an operirten Blindgeborenen.* Von Dr. THEODOR LOEWY. Leipzig: Grieben, 1884. Pp. 70.

This is a careful study of the early modern treatment of the question of *κοινὰ αἰσθητά* first signalled by Aristotle. The author, regarding Locke as the proper founder of psychological analysis in modern philosophy and recognising the immense stride in advance of his predecessor taken by Berkeley, compares their doctrines of sight and touch as to how far these two senses yield common elements of perception. He notes that, while Hobbes, in a merely passing reference to the subject, continues to speak, with Aristotle, of common sensibles, but confines them within the field of sight and touch, Locke, in other language than Aristotle's, but within Hobbes's narrower limits, expressly raises anew the old question by asserting that simple ideas of space or extension, of figure and of rest and motion are got by both sight and touch. How Locke's very unsatisfactory account of these "ideas" is contradicted by the better psychological doctrine implied in his references to Molyneux's problem introduced into the second edition of the *Essay*, is set forth at length. The author then passes to the exposition of Berkeley's greatly more developed theory of sight and touch, and brings clearly into view the circumstance that this theory, disposing as it does utterly of Locke's version of the doctrine of common sensibles, obtained experimental verification after being wrought out originally by way of speculation. A final section (pp. 62-70), after citing the earlier experimental cases from Cheselden's (1728) onwards to Nunnely's (1858), adds a short account of later ones observed by Hirschberg and von Hippel and reported in *Grüfe's Archiv*, 1875, 76. In the author's view, all of them, "in spite of many discrepancies, yield the result that congenitally blind subjects on obtaining sight by way of operation do not at first recognise by sight forms which they have previously learnt to distinguish sufficiently by touch, also do not at once distinguish form even visually."

*Die Philosophie als Idealwissenschaft u. System.* Eine Einleitung in die Philosophie. Von J. FROHSCHAMMER, Professor der Philosophie in München. München: Ackermann, 1884. Pp. 98.

A plea for the continued independent existence of Philosophy—as dis-

tinct on the one hand from the so-called exact and positive sciences, and not to be resolved into mere theory of knowledge on the other, but to be upheld as aiming at systematic explanation of the world from a single principle. The author's principle is the Phantasy (at once objective and subjective) which he has expounded and defended in a series of works previously noticed in these pages (see especially *MIND VII.*, 398). It is, he here again contends, a universal living and fruitful principle, not reached by abstraction from the special sciences, but open to direct observation and so fitted to yield a peculiar science of ideal truth, which is Philosophy.

*Katechismus der Psychologie.* VON FRIEDRICH KIRCHNER. Leipzig: Weber, 1883. Pp. viii. 292.

This is one of a long series of Catechisms (mostly illustrated) bearing upon the Sciences, Arts and Industries, to which the author has previously contributed the pieces dealing, respectively, with History of Philosophy, Church-history, Ethics and Logic. Otherwise a somewhat versatile writer on philosophy and religion, he has here produced, within the compass of a small and cheap handbook, a rather remarkable treatise on his subject. While treating with intelligence and considerable independence the topics of scientific psychology as they are now generally recognised, he has been able also to discuss to some purpose the metaphysical question of the nature of mind, with the relations of mind and body; and, while giving useful references to the most recent as well as earlier psychological literature, he finds room for an express section of no less than 30 pp. on the history of the science from its first beginnings in Greece. Even the pathological side of mental life has not been overlooked, having 12 pp. allotted to it at the end. The whole work is more thoroughly done than anyone would suppose from its width of range, and it cannot be read without instruction even by a more advanced class than the elementary students for whom it is in the first instance intended. In the properly psychological Part (following upon an Introduction, pp. 1-47, and Part I., "Das Wesen der Seele," pp. 48-139), the order of topics is, General View, Sensations, Movements, *Vorstellen*, Feelings, Affections, Impulses, Desire, Willing, Freedom of Will, Mental Diseases.

*Geschichte der Psychologie.* VON DR. HERMANN SIEBECK, Professor der Philosophie an der Universität Giessen. Erster Theil, Zweite Abtheilung: "Die Psychologie von Aristoteles bis zu Thomas von Aquino". Gotha: Perthes, 1884. Pp. xi. 531.

The author, who has passed, since he published the earlier section of his work in 1880, from Basel to Giessen, has now completed in this second section the first of the three Parts into which the whole will be divided. His design, as was previously mentioned (*MIND XXI.*, 150), is to separate out, as far as possible, from history of philosophy in general the story of the progress of psychological inquiry in particular, looking to the position which psychology has won or is winning as special science. Now that he has traced out the whole course of Ancient Psychology with its influence as protracted through the Patristic period to the culminating point of Scholasticism, it becomes possible to estimate with effect the manner and results of his investigation, and this we hope to do in a future Number. Meanwhile it should be said that the present section confirms and deepens the impression of thoroughness of treatment given by the former one. The general subject of the volume is "The development of Psychology as philosophical science under the head of Aristotelianism"; its foundation as "philosophical discipline" by Socrates and Plato having been already delineated. The treatment is disposed under the four heads: (1) Psychology

of Aristotle (pp. 3-127); (2) Monistico-naturalistic Psychology, after Aristotle (pp. 128-296); (3) Spiritualistic reaction against Naturalism (pp. 297-357); (4) Ancient Psychology under the influence of Christian thought (pp. 358-476). The sub-head Scholasticism (pp. 401-76), while covering the Realistic movement as far as Thomas, leaves the beginnings of new inquiry, by Roger Bacon, by the Nominalists, as also by Duns Scotus, to be considered in connexion with the following period, fixed by the author to end with last century, as the subject of his Part ii.; while Part iii. will record all the varied psychological activity of the present century.

*Kant's Theorie der Materie.* Von AUGUST STADLER. Leipzig: Hirzel, 1883. Pp. ix. 268.

The author, who in 1876 published one of the best pieces of newer Kantian work, *Die Grundsätze der reinen Erkenntnistheorie in der Kantischen Philosophie* (Hirzel, pp. 158), now attempts "to set out the main ideas of Kant's *Metaphysische Anfangsgründe der Naturwissenschaft* in such a way as that all the difficulties that admit of solution may solve themselves". In spite of the earlier proofs given by Kant of familiarity with physical conceptions, the treatise has been little regarded or has been set aside as of no scientific value. What Dr. Stadler here seeks to show is how strictly the theory of matter which it contains is related to the fundamental doctrine of Critical Idealism. Its value will then be rated according to the importance that is attached to philosophical insight. The work of exposition and commentary is done with admirable thoroughness, and may be said to bring the treatise for the first time completely within range. Dr. Stadler does not overlook the merits of Professor Watson's summary of the treatise in *Kant and his English Critics*.

*Erläuterungen zu Kant's Kritik der reinen Vernunft.* Von Dr. ALFONS BILHARZ. Wiesbaden: Bergmann, 1884. Pp. xvi. 366.

This work falls into three parts: (1) "The *K. d. r. V.* in a nutshell" (pp. 1-128); (2) "Common Human Understanding v. School-philosophy" (pp. 130-56); (3) "The *K. d. r. V.* stripped of its leaves" (pp. 159-366). The final critical process of *Zerblühterung* follows, one by one, the heads of the expository section, which is well and carefully done. The author, who has previously sought to found "a real natural philosophy" in a work entitled *Der Heliocentrische Standpunkt der Weltbetrachtung* (Cotta), formulates against Kant the general charge of having failed to carry out fully his thought of working in philosophy a complete revolution like that wrought by Copernicus in astronomy. What Kant accomplished in divesting the object of its sense-forms, referring these to the subject, and then pronouncing the real object or *Ding-an-sich* unknowable, was no more than as if Copernicus had transferred himself in imagination to the fixed centre of the earth from its moving surface. The proper analogue of the heliocentric point of view in the theory of knowledge is the truly objective as opposed to the subjective position—that from which the true object can be reached in thought, or, in other words, is understood to be covered by the subjective notion of object.

*Il Teismo filosofico cristiano teoricamente e storicamente considerato con ispecial riguardo a S. Tommaso e al Teismo Italiano del secolo XIX.* Per PASQUALE D'ERCOLE, Professore ordinario di filosofia nell' Università di Torino. Parte prima: "Le Contraddizioni e le infondate Dimostrazioni del Teismo". Torino: Loescher, 1884. Pp. xv. 700.

In this volume the author works out one half of an extensive scheme;

and will complete the other half in a second volume to appear in the course of this year. The whole scheme falls into four sections: (1) a general delineation of the principles of philosophical Theism as put forward by the Christian Fathers and Schoolmen; (2) an appreciation of its theoretic principles in respect of their intrinsic truth or falsehood; (3) a consideration of the historic *raison d'être* of Theism; (4) an examination of the particular form of Theism propounded by the Italian philosophers (Rosmini, Gioberti) of the present century. The author, in limiting the discussion to the philosophical Theism of Christian thinkers, specially Italian, whether of recent times or of the Scholastic period (represented chiefly by S. Thomas, who has been brought again into more credit than ever by the action of the present Pope), has obviously in view the practical exigencies of his time and country; but he has written, in the present volume, a book of undeniable philosophic importance, displaying at once wide historic erudition and intimate acquaintance with the results of modern inquiry, also no little independence of thought. Of the two sections making up the volume, the expository one, occupied more with the Schoolmen than the Fathers, is comparatively short (pp. 18-77). It is in the critical section, where he brings the scholastic doctrine face to face with modern philosophy along its whole course, that the author gives himself free rein. The criticism is disposed in two parts: the general principles of Theism being first considered in themselves; and next their scientific systematisation in natural theology, theistic metaphysic, logic, cosmology, angelology and anthropology, psychology, ethics and eschatology. Theistic psychology occupies pp. 422-526, and the criticism turns upon (1) the origin of the soul, (2) the duality of substances in man, (3) the relation of soul and body, (4) psychophysical phenomena. The eschatological questions of immortality and bodily resurrection are exhaustively treated from p. 545 to p. 693. The conclusion to which the author comes as the result of his whole survey is that the principles of philosophical Theism are at no point demonstrated and are at variance both with reality and with themselves. He is forward, however, to draw the distinction between philosophy and religion, reason and faith, and promises to enlarge upon this in his remaining volume.

Other Books, &c., received:—

- Evolution (as taught), a Myth illusive and degrading*, London: Ballantyne, Hanson, pp. 254.  
 G. Haddon, *A Law of Development*, London: Haddon, pp. 48.  
 C. H. Scribner, *Where did Life begin?* New York: Scribner, pp. 64.  
*Clavis Rerum*, Norwich, Conn.: Robinson, pp. 142.  
 P. Piper, *Schriften Noth's u. seiner Schule*, Bde. ii., iii., Freiburg i. B. u. Tübingen: Mohr, pp. 644, 415.  
 F. Koegel, *Die körperlichen Gestalten der Poesie*, Halle: Schwetschke, pp. 46.  
 C. Menger, *Die Irrthümer des Historismus in der deutschen Nationalökonomie*, Wien: Holder, pp. 87.  
 J. Volkelt, *Ueber die Möglichkeit der Metaphysik*, Hamburg, u. Leipzig: Voss, pp. 40.  
 J. Bergmann, *Ueber den Utilitarianismus*, Marburg: Elwert, pp. 33.  
 W. Preyer, *Specielle Physiologie des Embryo*, 1te Lief., Leipzig: Grieben, pp. 160.

## IX. CORRESPONDENCE.

IN MIND XXXII. Mr. J. Venn reviews an article of mine on "A New Algebra of Logic" in *Studies in Logic* by Members of the Johns Hopkins University. In the course of this review he gives my solution of a certain simple problem, and then proceeds to give what he calls "the solution as it might be worked out on Boole's plan". He gets as a conclusion, "All  $d$  is either  $a$  or  $b$  or  $c$ ". This he says is in reality the same as mine, which, relieved of a slight redundancy, is "There is some  $b$  or  $a$ , or else all  $d$  is  $c$ ". Now, every reader must have seen that these two propositions are far from being the same. It seems to me worth while therefore to point out where the error lies, especially since it is a fundamental one, and moreover vitiates Mr. Venn's treatment of hypothetical propositions in his *Symbolic Logic*.

Mr. Venn says that he considers  $\gamma\delta(1 - a\beta) = 0$  "to exactly express symbolically" the hypothetical proposition 'If no  $a$  is  $\beta$  all  $\gamma$  is  $\delta$ '; "for it expresses the fact that when  $a\beta = 0$  (*viz.*, No  $a$  is  $\beta$ ) then  $\gamma\delta = 0$  (*viz.*, All  $\gamma$  is  $\delta$ )". Of course, no one questions the fact that  $\gamma\delta(1 - a\beta) = 0$  (which Boole would have read 'All  $\gamma$  which is not  $\delta$  is both  $a$  and  $\beta$ ') implies the hypothetical proposition which Mr. Venn considers to be its "exact" meaning; but it implies 8189 other hypothetical propositions of the same kind. For Mr. Venn's principle of interpretation, generally expressed, seems to be as follows: If  $\bar{X} = PQ$  and  $P$  and  $Q$  contain no logical factor in common, then  $X = 0$  means 'If  $\bar{Q} = 0$  then  $P = 0$ '. Implies it of course, but it implies as well 'If  $\bar{P} = 0$  then  $Q = 0$ ,' and also a similar pair of hypothetical propositions for every other way of separating  $X$  into two logical factors prime to each other. Thus  $\gamma\delta(1 - a\beta)$  contains four class-symbols, and has, when developed, three aggregant terms. It has therefore  $2^4 - 3$  logical prime factors, *i.e.*,  $\gamma\delta(1 - a\beta) = (a + \bar{\beta} + \bar{\gamma} + \delta)(a + \bar{\beta} + \gamma + \delta)(a + \bar{\beta} + \gamma + \delta) \dots$  There are thus  $2^{12} - 1$  ways of separating  $\gamma\delta(1 - a\beta)$  into two logical factors prime to each other, and hence  $2^{13} - 2$ , or 8190, hypothetical propositions which may be inferred from  $\gamma\delta(1 - a\beta) = 0$ ; but even all these do not express its full logical content.

The problem above mentioned is as follows:—"What may be inferred independent of  $x$  and  $y$  from the two premisses 'Either some  $a$  that is  $x$  is not  $y$ , or all  $d$  is both  $x$  and  $y$ ,' and 'Either some  $y$  is both  $b$  and  $x$ , or all  $x$  is either not  $y$  or  $c$ , and not  $b$ '?" These two disjunctive propositions are of course equivalent to the two hypothetical propositions 'If all  $a$  that is  $x$  is  $y$ , then all  $d$  is both  $x$  and  $y$ ,' and 'If no  $y$  is both  $b$  and  $x$ , then all  $x$  is either not  $y$  or  $c$  and not  $b$ '. Mr. Venn expresses these as follows:—

$$\begin{aligned} d(1 - xy)(1 - axy) &= 0, \\ xy(1 - cb)(1 - bxy) &= 0, \end{aligned}$$

and then reduces them to the simpler forms,

$$\begin{aligned} d(xy\bar{a} + \bar{x}) &= 0, \\ xy\bar{b}\bar{c} &= 0. \end{aligned}$$

Eliminating  $x$  and  $y$  he gets the conclusion,

$$d\bar{a}\bar{b}\bar{c} = 0.$$

This conclusion he reads, as Boole would have read it, 'All  $d$  is either  $a$  or



$b$  or  $c'$ . But this is by no means the valid conclusion from the premisses of the problem.

Mr. Venn's error lies in the fact that his symbolic statement of the first premiss may stand equally well for 2045 other hypothetical propositions, looking at it from his own point of view. Likewise his statement of the second premiss may stand equally well for 32,765 other hypothetical propositions. Lastly, his symbolic conclusion  $dabc = 0$  may stand for 32,766 different hypothetical propositions when interpreted according to his peculiar method. One of these hypotheticals is the proper conclusion from the premisses of the problem, since his symbolic premisses imply the premisses. It would have been remarkable if Mr. Venn had been able to tell which of the 32,766 is the correct conclusion. It is still more remarkable that he did not read  $dabc = 0$  as a hypothetical at all, but gives the Boolean interpretation of it. My conclusion, whose accuracy he does not impeach, shows how he might have read  $dabc = 0$  so as to get the proper conclusion from the premisses of the problem, *viz.*, by dividing  $dabc$  into the two logical factors  $\bar{a}b$  and  $\bar{c}$ , and equating to zero the negative of  $\bar{a}b$  as the antecedent and equating to zero  $\bar{c} = 0$  as the consequent. Thus we have 'If  $\bar{a}b = 0$  then  $\bar{c} = 0$ ,' that is, 'If there is no  $a$  nor  $b$ , then all  $d$  is  $c$ ,' or 'Either  $a$  or  $b$  exists, or all  $d$  is  $c$ '.

In Mr. Venn's reprint of my solution there is a typographical error. The term  $dx$  should read  $\bar{d}x$ .

O. H. MITCHELL.

On the main point in question, *viz.*, the inadequacy of the expression  $\gamma\delta(1 - a\beta)$  to express the proposition 'If no  $a$  is  $\beta$  then  $\gamma$  is  $\delta$ ,' I must quite admit the effectiveness of Mr. Mitchell's remarks. But I shall be glad, with the Editor's permission, to explain more fully on another occasion in what sense I proposed it, and to what extent I still think that it may serve such a purpose. I will only remark here that I never in any published work claimed the expression as exactly expressing the customary signification of such hypotheticals, though I certainly thought that it might, in certain cases, express more of such signification than I now see that it could do.

On the fundamental principle which underlies the interpretation of these hypotheticals, *viz.*, the impossibility of expressing particular propositions on a 1 and 0 scheme, I judge that I am entirely at one with Mr. Mitchell. I have urged—as against Boole and Jevons—as strongly as I could that such propositions demand some third symbol, whether it stand in the place of copula or predicate, and cannot be represented with the ordinary notation for universals.

J. VENN.

[Miss Ladd (Mrs. Fabian Franklin), author of another paper in the *Studies in Logic*, also writes, with reference to Mr. Venn's Critical Notice in MIND XXXII., that the second sentence of the quotation on p. 589, which he found obscure, should have had the words "of the product" inserted after the words "partial inclusion".—EDITOR.]

## X.—MISCELLANEOUS.

The Clarendon Press will in April publish, in two volumes octavo, an English Translation of the late Professor Lotze's *Logik und Metaphysik*, edited by Mr. B. Bosanquet, Fellow of University College, Oxford. These volumes form Parts i. and ii. respectively of the *System der Philosophie*, in which Lotze had intended to give a final and complete exposition of his philosophical views. The projected Part iii. would have dealt with the Philosophy of Æsthetics and with Moral Philosophy; but the author's death shortly after he had entered, as was hoped, on a wider sphere of activity by accepting a Professorship at Berlin, prevented this completion of the *System*. Each of the volumes consists of three books. In the first book, "Of Thought," the *Logic* deals with the traditional forms of notion, judgment, and syllogism, subjecting them to a free criticism, and to an interpretation directed to elucidating their real nature and use. In the second book, "Of Investigation," no distinct system is followed, but the actual methods of proof and of research are analysed in extreme detail and with copious illustration. Book third, "Of Knowledge," approaches the problem (which has so far been kept in the background) of the relation between knowledge as it exists in the human intelligence, and any reality independent of or external to that intelligence. The first book of the *Metaphysic* bears the name of "Ontology," and under this title treats of the modes of being and of inter-connexion which may or must be attributed to a world of things if it is to be thought of as actually existing. The second book, "Cosmology," criticises the specific forms and principles which are the groundwork of our knowledge of nature; such as Time, Space, Motion, and the limits and significance of the mechanical aspect of the world. In the "Psychology" (book third) the author discusses the nature and activities of the soul, and its relation to the principal nervous centres; treating, for instance, of the growth of a sense of locality both in sight and in touch, of memory and association, of attention, and of the initiation of voluntary acts. In this book the author restates with some modifications his well-known doctrine of local signs. The Translation is the work of several persons; it has been carefully revised throughout, and submitted, where it seemed necessary, to mathematical experts. Tables of Contents and Indices have been added.

The Aristotelian Society for the Systematic Study of Philosophy, which has recently had a considerable accession of members, now holds its meetings at the rooms of the Royal Asiatic Society, 22 Albemarle Street, on alternate Mondays, at 8 P.M. as before. At the meeting of Jan. 7th, a communication was read from Mr. Charles Bray "On the Analogy between Sir I. Newton's Universal Spirit and the Force of our Modern Discovery," which was followed by a discussion on the subject of Force. The study of Hume's *Treatise of Human Nature* was commenced on Jan. 21st, by a paper on Part i., "Of Ideas, &c.," by Mr. H. W. Carr; and was continued on Feb. 4th, by a paper on Part ii., "Of the Ideas of Space and Time," by Mr. W. Cockburn; and again on Feb. 18th, by a paper from Mr. A. F. Lake on Part iii., "Of Knowledge and Probability"; the reading of the papers being in every instance followed by a discussion. At the meeting of March 3rd, reserved for original communications, a somewhat elaborate paper was read by Mr. E. P. Serymgour, Vice-President, on "Perception and Conception, a Vindication of Idealism"; discussion of which occupied the remainder of the evening.

Prof. Hermann Ulrici, who has for so long been one of the most prolific of German philosophical writers and joint-editor of the oldest of German philosophical periodicals, the *Zeitschrift für Philosophie u. philosophische Kritik*, died at Halle on 11th January, at the age of 78.

Frau Olga Plumacher, who contributed the article "Pessimism" to MIND XIII., will publish in the beginning of May, at Heidelberg (Weiss), a work entitled *Der Pessimismus in Vergangenheit u. Gegenwart*.

THE JOURNAL OF SPECULATIVE PHILOSOPHY.—Vol. XVII., No. 3. K. Fischer—The Centennial of the *Critique of Pure Reason* (trans.). Goeschel—On the Immortality of the Soul (trans.). Fichte—Facts of Consciousness (trans.). R. G. Hazard—Man a Creative First Cause. W. T. Harris—Philosophy in Outline (i.). Notes and Discussions, &c.

REVUE PHILOSOPHIQUE.—IXme Année, No. 1. H. Spencer—Passé et avenir de la religion. P. Tannery—Critique de la loi de Weber. Ch. Lévêque—L'esthétique musicale en France: v. Psychologie des timbres. Revue générale (E. Gley—Les aberrations de l'instinct sexuel d'après des travaux récents). Analyses et Comptes-rendus. Rev. des Périod. No. 2. P. Regnaud—L'évolution de l'idée de 'briller' en Sanskrit, en Grec et en Latin. F. Bonatelli—Remarques sur les sensations et les perceptions. Guyau—L'esthétique du vers moderne (i.). Analyses et Comptes-rendus. Rev. bibliographique. Variétés (Le programme de l'Agrégation de philosophie en 1884). Rev. des Périod. No. 3. A. Bertrand—Deux lois psychophysiques. Guyau—L'esthétique du vers moderne (fin). G. Lechalas—Sur le mode d'action de la musique. Analyses et Comptes-rendus (L. Stephen, *The Science of Ethics*, &c.). Rev. bib. Rev. des Périod.

LA CRITIQUE PHILOSOPHIQUE.—XIIme Année, Nos. 43-52. C. Renouvier—Les raisons physiques de poser l'existence d'un monde invisible (43, 45, 48); La doctrine de l'immortalité conditionnelle (51). Ch. Pellarin—La sociologie de M. H. Spencer (45, 46, 51, 52). F. Pillon—Charles Pellarin (47); La psychologie de la France selon Henri Martin (50); La religion laïque, religion du Père (50); A propos de la notion du nombre (52).

LA FILOSOFIA DELLE SCUOLE ITALIANE.—Vol. XXVIII., Disp. 3. T. Mamiani—Filosofia estetica: Galleria nazionale d'arte moderna in Roma. P. Ragnisco—La teleologia nella filosofia greca e moderna. A. Macchia—Pensieri di filosofia: Lettera terza ad uno studente di Università. T. Roncone—Lettera a T. Mamiani intorno allo studio della filosofia in Londra. T. Mamiani—Testamento d'un Metafisico.

PHILOSOPHISCHE MONATSHEFTE.—Bd. XX., Heft 1. R. Eucken—Partheien u. Parteinamen in der Philosophie. E. v. Hartmann—Mein Verhältniss zu Schopenhauer. Recensionen u. Anzeigen. Literaturbericht, &c. Heft 2, 3. B. Erdmann—Mittheilungen über Kant's metaphysischen Standpunkt in der Zeit um 1774. R. Lehmann—Ueber die psychologische Grundanschauung der Kantischen Kategorien. Recensionen u. Anzeigen. Literaturbericht. Bibliographie, &c.

VIERTELJAHRSSCHRIFT FÜR WISSENSCHAFTLICHE PHILOSOPHIE.—Bd. VIII., Heft 1. E. Laas—Ueber teleologischen Criticismus. K. Lasswitz—Giordano Bruno u. die Atomistik. A. Marty—Ueber subjectlose Sätze u. das Verhältniss der Grammatik zu Logik u. Psychologie (i.). G. Heymans—Zurechnung u. Vergeltung: Eine psychologisch-ethische Untersuchung (i.). Anzeigen. Selbstanzeigen. &c.